

Web purists are leery of Lotus' Domino server, US West's Motti Goldberg found. The Enterprise Network, page 51

Punchy Web commerce apps need skills both techie and artistic. Corporate Strategies, page 63

The Newsweekly for Information Technology Leaders News updates, features, forums: www.computerworld.com April 21, 1997 • Vol. 31 • No. 16 • 168 pages • \$3/Copy \$48/Year

Scalability concerns grow

▶ Windows NT not enterprise-ready, critics claim

By Laura Di Dio

TO QUELL CRITICS who charge that Windows NT lacks the necessary processing power to be an enterprise server, Microsoft Corp. next month will host a 'scalability day' to demonstrate forthcoming clustering and enterprise-class options for Windows NT.

The event is targeted at users who are increasingly frustrated by the Redmond, Wash.based company's repeated delays in delivering even basic two-way Windows NT Wolfpack clustering.

"I'm not sure Microsoft really has a clue about clustering or scalability," said Don Ramsey, information technology architect at Dallas Children's Medical Center in Dallas.

Analysts say Microsoft has a lot to prove on the scalability

Microsoft officials confirmed that scalability day will be May 20 in New York. CEO Bill Gates; Paul Maritz, group vice president; and Deborah Willingham, vice president of the enterprise customer unit, will address the Scalability, page 16



Hold that thought, IS tells E-mailers

// It's thumbs-up

for HP and IBM, according to

By Kim Girard and Barb Cole-Gomolski

10 categories, including

HP's win in printers

and IBM's in databases. Users were less pleased

with Sybase and Computer Associates. Buyer's

FOR PAUL EVANS, an IS analyst at the Federal Aviation Administration in Washington, growing E-mail volume became a problem that couldn't be ignored.

So the FAA, which has 36,000 users on Lotus Development Corp.'s CC:Mail, imposed a 2M-byte limit on message size during the day and a 5M-byte cap at night. It also reserved file transfer protocol sites for larger file transfers.

With corporate use of electronic mail exploding and the Internet beckoning, policies such as the FAA's are becoming more widespread. And a grow-

Hold that thought, page 127

New laptops push envelope at both ends

By Mindy Blodgett

THE LAPTOP MARKET is taking off - in opposite directions.

On the low end are ultraultraportable computers. On the high end are heavy-duty desktop replacements, called luggables.

Ultra-ultraportables 0000 20 hours of battery life and offer 6- to 10-in, screens. But these 19 stripped-down models lack CD-ROMs and other glitzy features and are essentially limited to

Portables, page 14

Texaco IS rebels open cash gusher

Mayerick developers at Texaco. Inc. are flouting conventional wisdom about data warehousing with stunning success. One of their applications yielded a thirtyfold return on investment by showing where more oil could be extracted from existing wells.

The team's formula: Cultivate a grassroots network of internal customers and quickly build local databases that can solve business problems.

But can this popular, bottom-up approach keep working as user demand grows?

Managing, page 76

Computerworld's customer satisfaction survey of 1,600 IS managers. HP and IBM each placed first in three of the

#BXBBJFT# ******** CAR-RT SORT ** C035 #48103UIV300SR003# JUL 96 001 012096### less than 2 pounds, have up to UNIVERSITY MICROFILMS INT SERIAL PUBLICATIONS

Guide, page 83

300 N ZEEB RD ANN ARBOR MI 48103-1500



Professional P5-133 System

- Intel® 133MHz Pentium® Processor
- 16MB EDO DRAM
- 256K Pipelined Burst Cache
- Vivitron®500 .26dp Monitor (13.9" viewable)
- 2MB SGRAM, 3-D 64-Bit PCI Graphics
- 1GB 11ms EIDE Hard Drive
- 12X CD-ROM & 3.5" Diskette Drives
- 7-Bay Mini Tower Case
- 104° Keyboard & Microsoft® IntelliMouse™
- MS® Windows® 95
- MS Office 97, Small Business Edition plus Bookshelf® 96
- Gateway Gold[™] Service and Support for Desktops

\$1529 Business Lease \$56/mo.

Professional P5-166 System

- Intel 166MHz Pentium Processor
- 16MB EDO DRAM
- 256K Pipelined Burst Cache
- CrystalScan®700 .28dp Monitor (15.9" viewable)
- 2MB SGRAM, 64-Bit PCI Graphics
- 2GB 11ms EIDE Hard Drive
- 12X CD-ROM & 3.5" Diskette Drives
- 7-Bay Mini Tower Case
- 104* Keyboard & MS IntelliMouse
- MS Windows 95
- MS Office 97, Small Business Edition plus Bookshelf 96
- Gateway Gold Service and Support for Desktops

\$1819 Business Lease \$67/mo.

Professional G6-200 System

- Intel 200MHz Pentium® Pro Processor
- 32MB EDO DRAM
- 256K Internal Cache
- Vivitron700 .26dp Monitor (15.9" viewable)
- 4MB SGRAM, 64-Bit PCI Graphics
- 2GB SCSI Hard Drive with Controller
- 12X SCSI CD-ROM & 3.5" Diskette Drives
- 3Com® 10/100 PCI Ethernet Adapter
- 12-Bay Tower Case 104* Keyboard & MS IntelliMouse
- MS Windows NT® 4.0
- MS Office 97, Small Business Edition plus Bookshelf 96
- Gateway Gold Service and Support for Desktops

\$2929 Business Lease \$108/mo.

Sol

11.3 ■ Inte ■ 16M

■ 256 ■ Zoo

■ 1MB ■ IGB

Mod
 Mod
 16-1
 NiM

■ 85-

■ Car ■ MS

■ Gate



If you've ever seen the eyes of a bull about to charge, you know what 2,000 pounds of unstoppable fury looks like. When it comes to satisfying your business's needs,

Gateway 2000's Major Accounts team has the same look of determination. We'll charge your business challenges like a raging bull. That attitude has helped Gateway do business with 8 out of 10 Fortune 1000 companies in the last three years. Companies like insurance giant

Aetna, which just named Gateway Supplier of the Year.

Why did more than 80 percent of these large corporations choose Gateway? Because Gateway delivers Value of Ownership: the winning

combination of high benefits and low cost for the life cycle of your computer. Gateway delivers it all in high-quality, customized PCs that go to work right out of the chute. In fact, we received the 1997



Product of the Year IS Manager's Choice Award for the P5-200XL desktop PC in the February 1997 issue of Datamation.

Call Gateway today and we'll thunder toward your business goals like a herd of bulls. We mean business.

Solo 2100 S5-120 Portable PC

- 11.3" DSTN Color Display
- Intel 120MHz Pentium Processor
- 16MB EDO DRAM expandable to 72MB
- 256K Pipelined Burst Cache ■ Zoomed Video Port
- IMB EDO Video RAM
- 1GB Hard Drive
- Modular 3.5" Diskette Drive
- Modular 6X min/11X max CD-ROM Drive
- 16-Bit Sound w/Stereo Speakers
- NiMH Battery & AC Pack
- 85-Key MS Windows 95 Keyboard
- Carrying Case
- MS Windows 95 & MS Works 95
- Gateway Gold Service and Support for Portable PCs

\$2099 Business Lease \$77/mo.



www.gw2k.com

GSA Schedule #GS-35F-4565G

© 1997 Gateway 2000, Inc. GATEWAY 2000, "C" logo, CrystalScan, Vivitron and "You've got a friend in the business" slogan are registered trademarks, and GATEWAY and Gateway Solo and are trademarks of Gateway 2000, Inc. The Intel Inside Logo, Intel and Pentium are registered trademarks of Intel Corporation. All other brands and product names are trademarks or registered trademarks of their respective companies. All prices and configurations are subject to change without notice or obligation. Prices do not include shipping or applicable sales tax. Many Gateway 2000 products are custom engineered to Gateway 2000 specificati which may vary from the retail versions of the software and/or hardware in functionality, performance or compatibility. **Leasing arranged by independent let panies to qualified commercial customers. Lease payments based on 36-month term. Lease terms subject to change without notice or obligation



8 Out of 10 Fortune 1000 Companies know...



Mail Boxes Etc. links sites via intranet

▶ Move to cut dial-up costs, abet communication

By Justin Hibbard

MAIL BOXES ETC. USA. INC. is one of several franchisers that plans this year to streamline its business processes by extending its intranet to franchisees.

The San Diego company expects to save between \$12,000 and \$14,000 per month by cutting dial-up connections. It also hopes to reduce costs by posting documents to its intranet rather than sending them by fax or mail.

But the company's greatest advantages may come from speeding up communications with franchise owners, said Jim

Amos, president and chief operating officer at Mail Boxes Etc. "I don't think there is anything for the future of franchising as important as the ability to communicate in real time." he said.

Franchisers lose sales and marketing opportunities regions where announcements of promotions and line expansions may not

reach a franchise owner for a week or more, Amos said. An intranet informs all franchisees immediately and lets them provide immediate feedback. They also can order supplies on the intranet.

The company expects within three weeks to contract with an Internet service provider to offer Internet connections to its 3,400 franchise locations worldwide. Franchisees will use the Internet to access Mail Boxes Etc.'s intranet instead of using expensive dial-up connections to access the company's widearea network.

The company will replicate the contents of its OS/2-based WAN servers to intranet servers based on Microsoft Corp.'s Windows NT and Internet Information Server. The replication will take about two months and will cost about \$60,000, said Ray Wahoff, director of manage-

ment IS at Mail Boxes Etc.

But for such a system to work, franchise owners must agree to use it. And that can be tricky, said Richard Villars, an analyst at International Data Corp. in Framingham, Mass.

"Most times, the franchisee would like some choice in terms of the level of service and commitment. [But] the franchiser would like it to be homogeneous," Villars said.

The company requires franchisees to pay \$19.95 per month to offset the cost of dial-up connections and will continue to require that amount to pay for Internet connections.



Andy Ekedahl, owner of an Mail Boxes Etc. store in Burnsville, Minn., said he is interested in the company's plan to allow franchisees to resell Internet ac-

counts to customers. The prospect of selling Internet access gives franchisees an incentive to use and support the company's extended intranet. "If you want to do this, you have to explain to the franchisee how it's going to make him money," Villars said.

Other firms that are extending Internet and intranet access to franchisees include Marriott International, Inc., Burger King Corp. and Taco Bell Corp.

Mike Pusateri, vice president of interactive marketing at Marriott, said providing an intranet link to franchisees is quickly becoming a matter of staying competitive in the franchise world.

be electronic-commerce players.

nka found the Web an easy. Half the IS job vaca way to link disparate databases during a merger. Internet, page 59 Regional Scope, page 106

In Des Molpes, Lincoln and Omaña,

In this issue

- Users integrate Unix and NT applications to get berefits of NT without having to port Unix-based software.
- Users need bandwidth guarantees on internal networks, but the tools to deliver on them are just beginning to ship.
- IBM plays catch-up online with new strategy designed to nix the perception it is an internet also-ran
- Sybase migration package due from test-tool company targets users who are forced to upgrade database versions.
- Windows NT taptops are popular, despite problems with portability.
- Oracle user group struggles to keep educational conference going despite competition from Oracle.
- 1S hiring will soar in the next two to three months and will rely heavily on college recruiting.

- Netscape's fortunes drop, and the future looks lonely for the scrappiest Web start-up, David Moschella writes.
- Readers castigate Frank Hayes, who admits IS is in more pain than some columnists will admit.

TECHNICAL SECTIONS

SERVERS & PCE

- IBM updates Ramac storage to make it faster and easier to move data among mainframe disk arrays.
- PCs will be cesier to manage and write software for under new Wintel spec being released for 1998 models, users said.

SOFTWARE

- Developers hope secure Java will let them write business-critical applications, not just animations.
- 47 Sybase forces users to upgrade with plan to stop support for older versions

THE ENTENPRISE HETWORK

- Lotus Notes legacy sparks political battles in shops considering Domino rather than pure Web servers.
- Users save money and time, following Microsoft's effort to cut its support costs.

THE INTERNET

- Hospitals use Web as quick, cheap option to link legacy databases.
- E-commerce requires links between Web sites and legacy data - links that delivered alarming results for FedEx.
- but users are still feeling around to find how their shops will work.

- Manufacturer upgrades to client/ server system for financials, easing planning and closing the books faster.
- Integrator cross-pollinates IS skills with writing, PR and graphics to make its multimedia appealing.

FEATURES

MANAGING

IS manager's bookshelf

IT CARRENS

- Computerworld's IT Careers index shows 20% of 1S pros are competing for the same talent pool.
- Database skills are in huge demand, but these jobs may not be suited for

ETC.

Company index	125
Editorial/Letters	36
How to contact CW	125
Inside Lines	130
Stock Ticker	123

Open systems pain

hoice isn't what it used to be.
Not long ago, the open systems advocates were trumpeting the virtues of pick-and-choose systems.
Buy one component here, another there, stitch them together, save money and live longer.

But at what cost? As our giant customer satisfaction survey beginning on page 83 demonstrates, the happiest users tend to be the ones with the *least* choice. To wit:

■Mainframe users are happier with their vendors and products than users of distributed systems, across the board. In fact, the lowest customer satisfaction score in mainframes is higher than the highest score among PC or Unix server users.

*AS/400 users are on cloud nine. Users rave about the AS/400's quality, service and support. And guess what? The AS/400 is the most proprietary system on the planet.

AS/400 users are on cloud nine.

• Mainframe systems management customers are a contented bunch, too, at least compared with users of comparable distributed tools.

Does this mean that the whole open systems thing was a mistake? Not at all. But the research demonstrates that the image of open systems as a panacea is a myth. Despite advertising claims, vendors have been unable to duplicate on networks the reliability and manageability of monolithic systems.

Is it any surprise that "integrating incompatible systems" consistently sits near the top of every survey of issues on the minds of IS managers?

The IS environment is moving toward distributed systems because they better support the more decentralized shape of business. But they are also more complex to build and manage. Choice brings with it some pain. You can look it up.

Paul Gillin, Editor Internet: paul_gillin@cw.com

HE FIFTH WAVE BY RICH TENNANT



Well, this is festive-a miniature intranet amidst a swirl of Java applets."

Microsoft is listening

▶ Vendor is taking steps to reduce overkill on update packages and fixes, and slows pace on new releases

By April Jacobs and Sharon Gaudin

OVERWHELMED USERS are telling Microsoft Corp. to hold off on 32-bit software and cut back on updates and fixes. Evidence is mounting that the Redmond, Wash.-based vendor is listening.

The company has been pushing a reluctant user base to adopt a 32-bit platform. For example, it has been slowly dropping support for 16-bit Windows 3.x in new versions of popular packages such as Microsoft Office, Visual Basic and Visual Studio. Microsoft also said it would restrict cost-cutting tools such as its Zero Administration for Windows initiative to 32-bit users.

Users also have been crying foul over overlapping mail strategies and an endless stream of updates, patches, upgrades, beta versions and service packs.

"I think the reality is that in the business community, there are a large number of 3.1 environments, and they can't ignore that." — Frank Delargy, Polaroid

"The sheer volume of new releases is overwhelming, and we've had less time to spend on some of those new releases. We're missing some opportunities because we don't have time to look at the number of things coming out," complained David Lingren, director of advanced development at Dunsgate, the information technology division of Wall Street powerhouse Dun & Bradstreet Corp.

Recent moves by Microsoft indicate it is changing its tune on some fronts. For example, it has taken the following steps:

The company announced two weeks ago that it would extend its Zero Administration tool kit to Windows 95 users. The tool kit will let Windows 95 users automate tasks such as software distribution and manage PCs from servers more efficiently.

Irom servers more efficiently.

Microsoft said it will merge its mail and messaging systems, Exchange and Outlook. That is a clear response to customers who say they are overwhelmed with what they see as too many

mail choices.

The company began advising users to standardize operating systems and issue patches and service packs selectively, saving the lion's share of changes for major product revisions.

■Microsoft, in some cases, has slowed the pace of developer releases, eliminating at least one program for its Visual C++ product that was inundating customers with undates.

Microsoft has little choice but to listen to users: The latest numbers from Dataquest in San Jose, Calif., show that 80% of corporate desktops still use Windows 3.x.

"We want to be able to give users functionality as it becomes available. But, on the other hand, we realize that corporations want to pick something and stay with it," said Stacey Breyfogle, a desktop product manager at Microsoft.

"I'm sure Microsoft would

like everyone to upgrade more quickly to 32-bit, but there are lots who haven't," said Larry Garden, senior information systems manager at Brewers Retail, Inc. in Mississauga, Ontario.

"I think the reality is that in the business community, there are a large number of 3,1 environments, and they can't ignore that," said Frank Delargy, information systems manager at Waltham, Mass.-based Polaroid Corp.

Microsoft also is trying to address objections to its large number of service packs, addons and upgrades.

For example, Lingren credited Microsoft with rethinking the speed of some releases. A special subscription program that allowed developers to automatically receive new versions of the Visual C++ development tool on a quarterly basis has been eliminated, he said.

"A few weeks ago, I received a letter saying that due to feed-



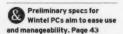
"The sheer volume of new releases is overwhelming"

back they had received from developers, [Microsoft] re-evaluated the program and decided it was too much change, too frequently, and they're discontinuing the practice," Lingren said.

INTERNET UPDATE

Microsoft also plans to provide users with Internet Update Manager in Memphis and Windows NT 5.0. The software, which resides within the operating system on the client, will update drivers from a corporate World Wide Web server and download patches and service packs automatically at the discretion of the information systems manager.

But this won't help users who want to stick with Windows 3.x, nor will it help users struggling with the problem today because the two operating systems aren't due out until late this year or early next year.



Come visit our Web site @ Computerworld

 KILLER QUESTIONS: What are the deadliest interview questions you will likely ever face? Author John Kador shares the insights of IS hiring managers. (www.computerworld.com/careers)

*CREATING A CASH GUSHER: At Texaco, a radical rips up conventional wisdom on data warehousing to help yield millions of dollars in extra oil. Computerworld's Rick Saia talks with IS rebel Michael Zeitlin in a RealAudio interview. (www.computerworld.com)

Daily news undates: (800) 340-2262

*If you need to know what's going on in the industry but aren't near your PC, get a recorded update at our toll-free number.

E-mail Rich Tennant at the swave @tiac.net

IBM makes merging iron easier

By Tim Ouellette

IBM IS TRYING to make it easier for users to cluster their mainframes.

The company last week announced new features for parallel sysplex, its mainframe clustering scheme, that lower the barriers for users considering such a move.

The features, available only on IBM's new G3 line of CMOS machines, include fewer standalone hardware requirements, less processing overhead and the capability for users to target specific applications to specific processors in a cluster.

Users have shown interest in mainframe clustering to reduce software costs and guarantee application availability. But the migration process has been slow [CW, March 31].

TOO COSTLY

Some managers at midsize data centers have been hesitant to even consider clustering, partly because they would have to buy extra coupling hardware, which directs traffic between mainframes (see chart).

"A lot of our customers have asked us to reduce the ante-up costs," acknowledged George Walsh, a director for IBM's S/300 hardware business.

So in July, IBM will free users from the separate charge for a coupling facility. Instead, users can turn a spare mainframe processor into an internal coupling facility (ICF) at a lower cost.

SOUND IS RE-ENGINEERING STILL RELEVANT?



But users at large data centers

said they probably would use

the ICF only as a backup. A pro-

cessor that doubles as an ICF

The issue would be availabil-

ity. We wouldn't want to lose

both a coupling facility and a

[mainframe] machine," said

Mark Krause, a senior technical

analyst at Commonwealth Edi-

A Hyperlink feature due in

July will slash the processing

overhead related to managing

clusters. Previously, overhead

sapped as much as 20% of pro-

cessing power, but Hyperlink

"IBM is providing additional

functions to make this stuff

more manageable," said Carl

Greiner, an analyst at Meta

Group, Inc. in Stamford, Conn.

With the changes. "the overhead associated with this clus-

tering is nowhere near what

IBM first projected," he said. □

son Co. in Chicago.

will cut that to 10%.

could be a problem if it fails.

YES! says Cambridge Technology Partners' Mike Korchinsky (right). In a rapid-fire business world, organizations are turning to a more agile, leaner form of re-engineering to keep up.

NO! says Collaborative Strategies' David Coleman (left). How can you defend a "revolution" with a 70% failure rate? Re-engineering ignores the nature of processes and, more important, it ignores people.



For the rest of the debate, see In Depth, page 95

3Com advances LANplex line

By Bob Wallace

GCOM CORP. is preparing a new version of its LANplex data center switch in an effort to provide its users with advanced switching functionality in a less expensive and more powerful package, Computerworld has learned.

The switch will let information systems managers substantially boost backbone network performance by including highspeed routing of multiple protocols. That simplifies network administration, analysts said.

"We'll have a next-generation

Bull offers GCOS users CMOS

LANplex switch that can route at 30 million packet/sec. by year's end," said Ron Sege, vice president of the Santa Clara, Calif., vendor's 3Com Systems switching group.

The as-yet-unnamed system will be based on more powerful application specific integrated circuits (ASIC) and processors, Sege added. ASICs are the brains of a switch.

Today's most advanced LANplex routes packets at about 2 million packet/sec.

A key difference between the LANplex and competing switches is that the LANplex will be able to route more protocols. It will handle IP, Novell, Inc.'s IPX and possibly Apple Computer, Inc.'s AppleTalk, Sege said.

RETAINED INTEGRITY

Details are sketchy, but Sege said the next-generation LANplex "will not obsolete existing products and will retain the software integrity LAN-plexes have today." 3Com offers two LANplex lines: the 6000, which was announced in early 1994, and the 2500.

"This sounds as if it will provide a great migration path for users who've already invested in LANplexes, because it will carry them into a higher-speed world," said Nick Lippis, president of Strategic Networks Consulting, Inc. in Rockland, Mass.

"But on the downside, there's a lot of time between now and then, and some smaller companies are already shipping this type product," Lippis said. "How much market share will they lose by the time they get the new system out?"

Competitors include Extreme Networks, Inc. in Cupertino, Calif.; Ipsilon Networks, Inc. in Sunnyvale, Calif.; and Xylan Corp. in Calabasas, Calif.

3Com officials wouldn't disclose pricing.

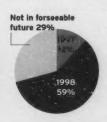
The system will support Fast-IP, 3Com's version of Layer 3 switching. Layer 3 switching calls for advanced and highspeed routing functionality to be built in to LAN switches.

When will users be operating a multisystem parallel sysplex?



Sites with more than 500 MIPS of mainframe capacity

Base: 33 data center managers



Sites with 200 to 500 HIPS of mainframe capacity

Base: 17 data center managers

*Includes some test-only parallel sysplexes

By Tim Ouellette

BULL HN Information Systems, Inc. is grabbing mainframe CMOS technology by the horns.

The Billerica, Mass., firm last week announced two CMOS aircooled mainframe models designed to keep its user base loyal to its GCOS line of proprietary mainframe systems.

The models, named Jupiter and Artemis, offer Bull's 3,000 customer sites worldwide the opportunity to eventually replace water-cooled mainframes with smaller but similarly powerful CMOS machines that cost less and save energy.

"We were pleased with what we saw, and it looks like they've answered our questions in terms of the future of the hardware platform," said Ted Hoffman, IS director at Graybar Electric Co., a St. Louis electricity distributor.

"Bull's customers need the scalability and cost reduction of its next-generation CMOS technology," said Mike Kahn, CEO of The Clipper Group, Inc. in Wellesley, Mass.

The Jupiter model, the DPS 9000/700, is a higher-end system that will let users trying to update GCOS applications add TCP/IP support and interoperability with Unix servers. The Artemis DPS 7000/MTS will replace Bull's current midrange line of mainframes.

Jupiter costs from \$650,000 to \$7 million. Artemis costs from \$75,000 to \$4.5 million. Both will ship next month. □

Tools connect Unix, NT islands

▶ Unix users tap in to NT applications

By Jaikumar Vijayan

UNIX SHOPS aren't rushing to port their business-critical applications to Windows NT. But some early users are employing a new class of tools designed to forge a tighter connection between the two worlds.

Integrating Unix and Windows NT systems lets users retain their investments in Unix while tapping in to the advantages of NT, such as its large base of office productivity software, observers said.

The new integration tools and interoperability suites extend integration beyond remote log-on, file access and print services to full-fledged sharing of directories, mail, messaging services and applications.

HARD WORK

But an integration project can be difficult and costly, analysts said. And the technologies may work only in certain application environments.

"Integrating the two environments is an [enormous task]," said Dave Hardin, team leader of information technology services at Star Enterprises in Delaware City, Del. "But there are

TIGHT LINKS

How users are integrating Windows NT/Unix

- File system integration
- Directory sharing
- Application sharing
- E-mail integration
- Porting Unix applications to Windows NT
- **■** Emulation

some tools that help," he said.

Just last week, Hewlett-Packard Co. announced Enterprise File System, which lets technical users transparently share applications and data between Unix and Windows NT systems.

And Softway Systems, Inc. in San Francisco this week will upgrade its OpenNT porting tool to let users port Unix graphics applications to NT and provide support for mixed networking.

Products from Citrix Systems, Inc. in Coral Springs, Fla.; Insignia Solutions, Inc. in Santa Clara, Calif.; Tektronix, Inc. in Wilsonville. Ore.: and others allow users to access Windows office productivity applications from Unix workstations.

And tools from companies such as Softway and DataFocus, Inc. in Fairfax, Va., let users port applications to NT while retaining a single code base for both environments.

The products complement technologies such as Sun Microsystems, Inc.'s Network File System and the Common Object Request Broker Architecture middleware to provide file-, print- and application-sharing services in mixed environments.

"Tools like this bridge the gap between Unix and Windows NT," said Eric Bradac, systems administrator at Western Sugar Co. in Denver.

The company plans to use Softway's OpenNT to administer its Unix servers from Windows NT workstations.

NASA's Langley Research Center in Hampton, Va., uses Insignia's Ntrigue server to let users open electronic-mail attachments created in Windows environments from Unix workstations.

"If we didn't have this particular setup, we would have probably had to buy separate PCs or write programs to do all sorts of

New Unix-NT products from Digital

Digital Equipment Corp. this week will announce new middleware and services for integrating its Unix and Windows NT environments.

The Maynard, Mass.-based company also will announce new partners that will help it provide cross-platform application development tools, NT ports and full NT versions of Digital Unix applications.

The announcements are part of Digital's AllConnect for Unix program, which is aimed at Unix/NT integration. The program was launched in September.

"This is a program aimed purely at Digital's installed base," said James Garden, an analyst at Technology Business Research, Inc. in Hampton, N.H.

"It is part of this whole Windows NT thrust by Digital," said Rob Young, technical support manager at Knight-Ridder MediaStream in Philadelphia.

"If they want to integrate Windows NT [into Unix and OpenVMS environments], they obviously have to do something with the middleware," Young said.

The latest enhancements to the AllConnect for Unix program include new releases of Digital's DECMessageQ and Sunnyvale, Calif.-based BEA Systems, Inc.'s ObjectBroker and Tuxedo software, all of which support Digital Unix and Windows NT. The middleware allows users to share, distribute and manage applications between the two environments.

Digital will also announce three new AllConnect services: Application Connectivity Services that link Windows NT/Unix applications, Application Migration Services that move applications between Unix and NT and Windows NT application services that build new Windows NT applications.— Jaikumar Vijayan

file conversions," said Roland Wallner, a systems administrator at NASA.

Star is using Nutcracker from DataFocus to port some of its Unix applications to NT. "The base software runs on both NT and Unix. This means we can grow functionality on NT without having a big impact on the Unix code," Hardin said. "This way, we have the flexibility of slowly migrating to NT over time."

GE venture developing 'net purchasing system

By Mitch Wagner

A SPIN-OFF OF General Electric Co. has taken a significant step toward upgrading its Internetbased service designed to help Fortune I,000 companies manage their supply chains.

The goal is to reduce time, money, paperwork and effort in bidding for and buying products online. That includes electrical components, industrial equipment and office supplies.

The company, TPN Register, has selected a start-up financed by Gartner Group, Inc. to rewrite the software used by the supply-chain service.

TPN Register, in Bethesda, Md., decided to outsource the project because "we didn't have the Internet expertise to keep it going at a brisk pace, to develop the product to where we wanted it to be," said program

manager Steve Kovacs.

TPN Register tapped EC Cubed, Inc., a 50-person startup in Wilton, Conn. EC Cubed is 40% owned by Stamford, Conn.-based Gartner.

EC Cubed will focus on TPN Post, which was designed for collecting bids and quotes for supply contracts. EC Cubed will build document-management features in to the Internet site so companies can post specifications and proposed contracts and collaborate on rewriting the documents.

The company will also build client software that will run as an extension to a World Wide Web browser. Users then will be able to store and work with information off-line while disconnected from the Internet.

TPN Register started out as GE's own supply-chain network. The industrial giant began doing business with its suppliers over the Internet in 1994. But on April I, GE spun the Trading Process Network (TPN) into a separate company, with a goal of licensing the software and services to other Fortune 500 companies.

TPN Register is also backed by New York-based Thomas Publishing Co., which makes catalogs of industrial supplies.

There are other players in this market, including Nets, Inc. in Cambridge, Mass., chaired by former Lotus Development Corp. head Jim Manzi. Also, The Chase Manhattan Bank Corp. and BVR LLC, both in New York, in December launched a joint venture called Intellisys Electronic Commerce LLC, for routine purchasing [CW, Dec. 2, 1996]. And about a dozen Fortune 500 companies, including American Express Corp., Chase and IBM, are looking to develop electronic commerce standards for routine purchases [CW, Nov. II, 1996].

TPN Register is the latest in a

series of steps that GE is taking to broaden its place as a vendor — as well as a user — of electronic-commerce services.

GE and Netscape Communications Corp. are partners in the Actra joint venture, which is charged with providing electronic-commerce software and services to businesses.

GE Capital Services, the company's financial services unit, created a consulting practice for internal use and eventually plans to offer the service to outside customers, too. □

Corrections

Because of a reporting error, a story in the April 14 Computer-world stated incorrectly that Silicon Graphics, Inc. (SGI) invested in Navio Communications, Inc. in Sunnyvale, Calif. Rather, Wei Yen, a former SGI executive, is president and CEO of Navio. Also, the name of the only company to ship a computer with Navio's browser is HDS Network Systems, Inc. in King of

Prussia, Pa., not Hitachi Data Systems Corp.

Because of a reporting error, a Marketplace article in the Jan. 13 issue contained incorrect product information about low-end uninterruptible power supply units from Best Power, Inc. in Necedah, Wis. Patriot 280, 280VA costs \$129. Patriot 420, 420VA costs \$179.

The chart with "IBM revving up

Ramac" in the March 17 issue included outdated market share estimates for the mainframe disk market. Current estimates from Gartner Group, Inc., project 1997 market share for mainframe disk systems at 43% for IBM and 41% for EMC Corp.

The photograph of Ken Ficara on page 77 of the April 14 issue should have been credited to Edward Santalone.

Computer Associates Presents A Conference And Exposition Featuring The World's Leading Business Software Products And Experts.

The Third Annual



17 User Conterences • 20,000 People • 6 Days • 1 Great City

Over 100 FREE Education Classes

Take advantage of any of the 100 free education classes on important industry issues like Windows NT, UNIX, Year 2000, Help Desk, JAVA, object-oriented programming, TCP/IP or

Internet/Intranet. Normally, you would have to pay hundreds or thousands of dollars, but at

CA-World'97 they're free.

6 Days, 144 Hours, 8,640 Minutes

CA-World'97 is six technology-filled, informationpacked days. Listen, learn, participate and share all the latest in technological breakthroughs and industry trends.

1 Huge World Resource Center

Explore the 300,000 square feet of exhibits from over 300 of the industry's hottest technology providers.



Discover The Magic Of Software At CA-World.

Unicenter TNG

1 World-Class Event

Be a part of one of the fastestgrowing high-tech user conferences in the world!

18 Industry Leaders

Charles B. Wang, chairman and Associates, leads a list of industry luminaries, like Scott McNealy. who will be speaking on today's technology.

chief executive officer of Computer

3,000 Informative Sessions

Be a part of 3,000 interesting and informative technical and end-user sessions given by industry experts.

300 Exhibitors

The World Resource Center will be packed with over 300 exhibitors. Look for these exhibitors: Sun. Intel. Microsoft. Fujitsu, Data General, HP, Digital, NCR, EDS, Novell, Tandem and many, many more.

2 Incredible Magicians

World-renowned Penn & Teller will entertain us once again with their one-of-a-kind show.

> To Register 1-800-CA INF097 www.cai.com



17 Conferences

Simultaneous CA conferences in 300 rooms:

ADC BAC

CADRE

CAMUS

Chevenne Partner

Conference

ESAC

GEM

IDIG IMC

InfoExchange

Ingres® World

opsXchange

Partnership

PRMS"

TechniCon Unicenter®

VARsity Club™



CA aims OpenIngres at NT, Internet

► Seeks to revive database, address technology lag

By Craig Stedman

COMPUTER ASSOCIATES International, Inc. this week will launch an effort to revive its OpenIngres database by announcing a reduced-cost release for Windows NT, according to sources briefed on the plans.

Workgroup

OpenIngres is the first part of a two-pronged CA strategy aimed at getting the database back on a more equal technology footing with rival products.

The Islandia, N.Y., company will follow up this summer with a new version that includes tighter ties to the Internet and several features that Ingres users have been requesting for years (see chart).

Users and analysts gave CA credit for trying to breathe new

life into the database, which it bought in 1994. But they said finding new customers and putting a stop to raids by other database vendors won't be easy.

CA is showing signs of putting more marketing weight behind Ingres, "but it may be too

late for us," said Charlie Lancaster, Unix data-

base administrator at the Texas Natural Resource Conservation Commission in Austin.

The state agency runs its environmental monitoring and permitting applications on Ingres 6.4, the last release before CA renamed the database Open-Ingres.

But new development is being tied to Oracle Corp.'s database, and the agency's management wants to move away from Ingres altogether eventually, Lancaster said

"People here were leery that Ingres wouldn't make it, and they knew Oracle would be around. And that feeling hasn't changed." he said.

CA's sales of Unix and Windows NT databases and related development tools grew almost 18% last year, according to preliminary figures from International Data Corp. (IDC) in Framingham, Mass. But most of the growth appears to have come on the tools side, while database revenue has "basically been flat," said Dan Kusnetzky, an analyst at IDC.

CA NOT TALKING

CA officials declined to comment on the upcoming announcements. Sources said Workgroup OpenIngres is aimed at Windows NT and Pentium-based Unix servers and will include all of the enterRESCUE MISSION

Computer Associates plans the following announcements for OpenIngres

Product	Features	Availability	
Workgroup OpenIngres	Low-priced version for Windows NT and Intel- based Unix servers	This week	
Openingres 2.0	New release with row- level data locking, multiprocessor support and native Web server interfaces	This summer	

prise-level OpenIngres capabilities at a reduced price that starts at \$235 per port.

By contrast, Oracle and other vendors have stripped functionality out of their databases to create lower-cost workgroup versions targeted at NT users.

OpenIngres 2.0 is in beta testing and will initially support Windows NT and the Solaris operating system, with a mix of other Unix flavors following by year's end, sources said.

Promised features such as

row-level data locking have been on the wish lists of Ingres users for years but kept getting put off from release to release, said Tom Blythe, a technical specialist at the American Mathematical Society in Providence, R.I.

"It's taken CA a little while to get their feet under [the database], but at least they're moving forward," Blythe said. "Hopefully, they can find some new customers and keep it a viable product."

Tools aid client/server monitoring

By Patrick Dryden

MUCH-NEEDED TOOLS for monitoring the quality of client/ server network service will debut at Networld/Interop '97 next month in Las Vegas.

New and enhanced products being introduced this week address an issue for information systems managers. They must detect poor performance by networks, systems and applications before users notice that service has slowed or disappeared.

That has always been the unwritten agreement between IS departments and users. But organizations that recognize the business value of information technology are expecting definite service levels for access to internal resources.

"Service levels have drawn a lot of attention here recently, due to awareness of how pervasive and crucial our network has become," said Bob Napier, a network engineer at Lockheed Martin Corp. in Bethesda, Md.

But a staff of 20 that supports a 15,000-user network in Tennessee is "stretched so thin that we can't react as quickly as we'd like," Napier said.

Napier said he seeks help from performance-monitoring and analysis tools in order to "be proactive and define sevice levels ourselves before they get forced on us."

IS managers used to just

throw bandwidth at problems to buy time, said Kathrin Winkler, senior consultant at The Registry, Inc. in Newton, Mass.

CAN'T KEEP UP

But usage is accelerating too fast, because of the growth in intranets and networked applications. "IS can't stay ahead of the curve, so they must manage requirements and expectations," Winkler said.

IS can't manage what it can't measure, so vendors try to deliver better performance-monitoring tools. And to make reports widely available, these tools allow broad access via a browser interface (see story at right).

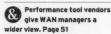
Hewlett-Packard Co. leads the pack in addressing service-level management needs, according to analysts. It has focused both its OpenView tool division and field consulting and training forces on the task.

HP will expand its NetMetrix Reporter software to analyze performance information from diverse sources for the first time. From one screen, operators will be able to see when performance drops below defined thresholds for systems and applications, not just for networks.

To do that, Version 5.0 will gather data from other tools in the OpenView line. Also, HP will extract proprietary performance information from other vendors' products, starting with routers and switches from Cisco Systems, Inc.

Future partners will include vendors of internetworking hardware, systems and applications, according to HP officials in Palo Alto, Calif.

But HP doesn't expect to ship NetMetrix Reporter 5.0 until October. It will cost \$5,500, plus additional charges for the probes, software agents and other management applications required to feed NetMetrix Reporter. □



Avoiding the help desk

Many vendors are announcing new ways to track performance and recognize trouble before the help desk telephone rings.

Support staff and even end users can access those reports from a browser over the corporate intranet to keep an eye on service levels.

Start-up System Management Arts, Inc. in White Plains, N.Y., this week will launch a next-generation event-correlation tool called InCharge.

The analysis software reduces the complex relationships among

networked components to a simple mathematical model instead of just filtering redundant alerts as existing products do.

Kaspia Systems, Inc. in Beaverton, Ore., will introduce a major overhaul next week to its Automated Network Monitoring system.

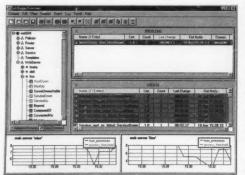
The new Java-based version addresses problems with scalability and slow report generation. It now tracks device availability instead of just traffic flow to provide service-level reports.

Technically Elite, Inc. in San Jose, Calif., next week will introduce a network probe and analysis software that supports the new Remote Monitoring (Rmon 2) standard for tracking application performance and packets.

FastMeter 4000 watches Ethernet links operating at 10M or 100M bit/sec. and reports to the new DomainMeter 8000 console. The tools, expected to ship in July, include Rmon 2 extensions that measure application response time and network availability to help isolate performance problems.

NetScout Systems, Inc. in Chelmsford, Mass., will introduce the first probe capable of monitoring wide-area network traffic over T3 lines.

The Netscout T₃ WAN EnterpriseProbe will ship in June for \$19,000. — Patrick Dryden

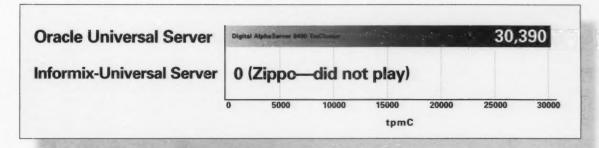


HP's NetMetrix Reporter will reveal performance experienced by end users from systems and applications, not just networks

Oracle vs Informix Benchmark Leader vs Bench Warmer

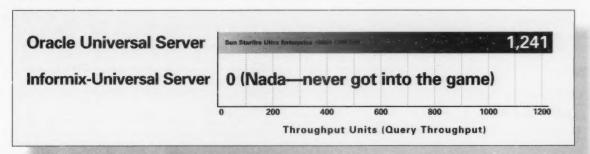
TPC-C Performance

The TPC-C benchmark is the industry standard test for measuring database On-Line Transaction Processing (OLTP) performance.



TPC-D Performance

The TPC-D is the industry standard benchmark for measuring query performance on large complex databases.



Oracle® Universal Server holds benchmark records for database performance. Informix-Universal Server has never published a single performance benchmark. So if you want a database that manages all your data: relational, spatial, text, messages, documents, images, audio and video, with proven high performance, call Oracle at 1-800-633-1071, ext. 11534, or find us on the Web at http://www.oracle.com. Or if you're not in a hurry, try calling Informix at 1-888-ICAN-WAIT. But please call one at a time.



People who work at (fiber)glass company shouldn't use paper

Elimination of file cabinets saves \$30M

By Julia King

SIX MONTHS after moving into a new, high-tech, paper-free headquarters, Owens Corning is well on its way to saving \$50 million in annual operating costs.

By eliminating all file cabinets, the Toledo, Ohio-based fiberglass manufacturer has already knocked off nearly \$30 million from its office space costs. The cabinets are unnecessary because the company has implemented new systems and policies that make paper just about obsolete.

Here is how the savings are estimated: A four-drawer file cabinet takes up six square feet of real estate. At a rental cost of \$30 per square foot, and with 14,000 file cabinets worldwide, Owens Corning is banking on a savings of about \$30 million.

By conducting virtually all internal business electronically from scheduling a staff meeting to reviewing new product designs — Owens Corning also has eliminated 50% of its copiers, 50% of its printers and 60% of its fax machines. That has saved millions more.

All policies, product information, memos, announcements and other news are now on an internal intranet instead of on naner.

Those communications are delivered over a vast fiber-optic network. Users access the network from identically configured PCs that run Microsoft Corp. business applications.

© COMPUTERWORLD

For these and related links, point your browser at www.computerworld.com/ links/970421paperlinks.html

The paperless office fact sheet: www.opticalimage.com/ facts.html

- A paperless future: www.emagazine.com/ featisbi.html
- ➤ Trying the paperless office: www.boston.com/globe/ plugged/pi328.htm
- ➤ Electronic approval: another step toward a paperless office: cause-www.colorado.edu/ information-resources/ ir-library/text/cemg236.txt

In addition to having Internet, intranet and electronic-mail access, each user can send and receive electronic faxes. Many users also have desktop scanners that digitize paper-based correspondence. Those who don't have scanners can convert incoming paper at one of several scanners on each floor. All data storage and backup is handled by Xerox Corp., which runs all of Owens Corning's printing, document management and electronic storage under a multiyear outsourcing

"It's a plug-and-play building," said Mike Radcliff, chief information officer at the \$4 billion company. "All applications are available through the internal network, so you pretty much have global, mobile access to all systems and information," he said.

That includes when users are away from their desks. Group meetings, for example, are held in one of the building's 24 multimedia presentation rooms. Those are equipped with electronic "soft boards" that electronically capture a presenter's written notes or diagrams. The notes can be distributed to attendees later via E-mail.

Radcliff said standardization

What used to be	is now			
A Rolodex	An electronic contact database			
A paper-based appointment book	An online scheduler			
A paper-based product diagram	An electronic "soft board" presentation			

has been key to the reductions. Equipping everyone with the same software makes access easier, because "we had to make it easier to find something electronically than [it was] to find it on paper," he said.

LOVE THAT ROLODEX

Not all users immediately embraced the new technologies, at least not without a certain amount of wariness.

Gretchen Ellis, an information services administrator, said the hardest thing to give up was her Rolodex.

Carol Eberly, who heads up the company's Global Link intranet initiatives, said she couldn't imagine life without her appointment calendar.

"It was a trust thing," Eberly said. "All I could think was, 'What if I came in and I couldn't get to my calendar [if the system crashed]?"

But now, Eberly said, she can't remember the last time she sent or received anything on paper.

If the network goes down, which is a rarity, according to Owens Corning staffers, users can work off-line until it comes back up. All data from network servers and users' personal drives is continuously backed up, so data loss is minimal in the event of an outage — usually it is no more than 30 to 40 minutes' worth of data, Eberly said.

The paper that remains at Owens Corning comes largely from outside. Customers still send letters and faxes that request product literature, for example. But those are forwarded electronically to the Xerox-run document center, which prints the materials and sends them to

By year's end, Owens Corning is scheduled to go live on SAP AG's R/3 system, which will link the Internet to accept incoming orders electronically.

For now, the challenge is educating users and selling the benefits of a paperless workplace to employees at other Owens Corning locations. Eberly's team will kick off that program next month.

"Paper-free is still a commitment," Eberly said. "We're not all the way there — yet." □

SHORT

Apple seeks state tax break

At the request of Apple Computer, Inc., California state Sen. John Vasconcellos (D-San Jose) introduced legislation that could give suffering computer firms refunds from state sales and usage taxes. The bill would apply only to computer makers that are losing money. Apple last week posted a \$7.08 million quarterly loss.

Microsoft earnings soar

Microsoft Corp.'s quarterly income rose 85% for the first quarter ended March 31, compared with the same period last year. The company said the increase was fueled by the sale of more than 8 million new licenses for Office 97. The Redmond, Wash.-based software giant reported a revenue increase of 45%, to \$3.21 billion for the quarter. Net income totaled \$1.04 billion.

'Avant a lawyer'

Six executives at Avant Corp. in Sunnyvale, Calif., have been charged with conspiracy and misappropriation of design secrets by the Santa Clara County, Calif., district attorney. The group is accused of stealing software code from Cadence Design Systems, Inc. in San Jose, Calif., and building Avant's first products on that code. Both companies develop software for semiconductor chip designers. Cadence had filed a civil lawsuit against Avant charging copyright infringement, conspiracy and theft of trade secrets. Avant denied the charges. Avant executives named in the indictment include Gerald Hsu, chairman, director and CEO.

British Steel scraps IBM deal

British Steel PLC has abandoned plans for a \$570 million information technology outsourcing deal with IBM. British Steel, in London, said only that IBM "did not fill our commercial requirements," according to a company spokesman. An IBM spokeswoman said the two companies "were not able to come to a mutual agreement." She declined to comment further.

Shareholders sue Informix

Informix Software, Inc.'s disclosure that it would report a big first-quarter loss has prompted a shareholder class-action lawsuit. Law firms in San Francisco and Orlando, Fla., last week jointly filed a suit charging Informix executives with making false and misleading statements about the Menlo Park, Calif., company's

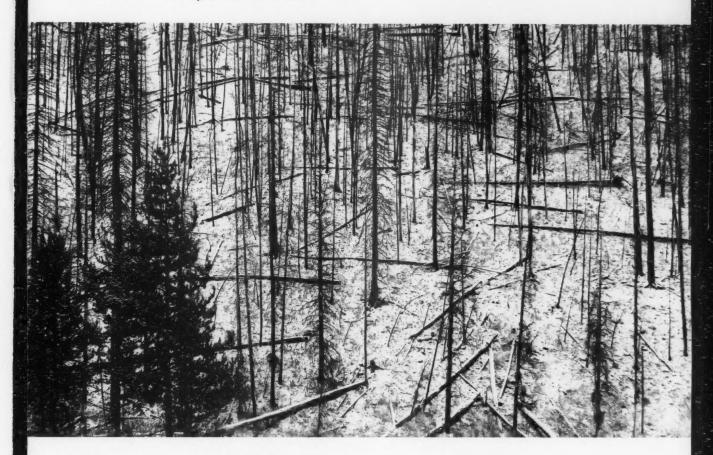
financial prospects. The lawsuit came on the heels of a Securities and Exchange Commission filing by Informix disclosing that about 25% of the \$708 million in software revenue it reported last year came from licenses that were still held by resellers at year's end.

VeriSign offers insurance

VeriSign, Inc. will offer a free data-protection insurance plan to users of its Digital ID software. The NetSure Protection plan, underwritten by U.S. Fidelity and Guaranty Co. in Baltimore, will provide protection against losses caused by the theft, disclosure, modification or corruption of a user's private key — one of the pieces of Mountain View, Calif.-based VeriSign's Digital ID authentication software. Users will receive a policy that gives them from \$1,000 to \$50,000 worth of protection, depending upon the type of Digital ID they have.

SHORT TAKES Data General Corp. posted a twofold increase in quarterly profits compared with a year ago. Net income was \$13.8 million on \$389.3 million in revenue... Cabletron Systems, Inc. in Rochester, N.-H., will announce plans this week to boost the performance analysis capabilities of its Spectrum network management platform.

If a problem is taken care of before it becomes a problem...

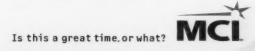


did it ever exist?

The snag with so many of today's distributed computing environments is the number of problems that seem to get distributed around the environment.

In the old days of file-and-print LANs, networks ran themselves. Today, with multiple protocol, interconnected LANs and WANs, managing a network can be a 24-hour-a-day pain in the neck. But it doesn't have to be, not with our around-the-clock, seven-days-a-week monitoring program. In fact, since acquiring SHL Systemhouse™ (recognized by industry analysts as a leader in client/server computing), we've built quite a reputation in distributed computing systems. To the point that Data Communications magazine just voted our enterprise management service, with its end-to-end, 24/7 service and support, one of their "Hot Products" for 1997. But that's just one of the very many programs we have to help you.

Check out the others at www.mci.com or call 1-800-338-6815 and start getting taken care of.



IBM firms up Internet strategy

By Mitch Wagner and Barb Cole-Gomolski

FACED WITH THE PERCEPTION that its Internet strategy is unclear, IBM last week introduced development tools and servers and laid out a strategy for Internet commerce. The company is positioning its Lotus Development Corp. Domino servers as a tool for collaboration and workflow management over the Internet.

For other forms of electronic commerce, IBM is offering its Encina transaction processors to handle large volumes of Internet payments and queries, and connectors to its DB2 databases for moving large data stores into cyberspace.

The strategy should help IBM clarify what it can offer users, who are now confused about why they should deploy IBM for Internet connectivity — despite the company's strong technology offerings.

"I personally always thought that IBM had more pieces of the [Internet] pie than anybody," said IBM user Patrick McNamara, a systems administrator at EMI Records, Inc. in New York. "They just haven't been that good at getting the point across."

Chief among the offerings announced last week are Lotus server products, designed for the low end of the commercial World Wide Web server user base.

Lotus Go, due this summer, is an entry-level Web server that will compete with offerings from Netscape Communications Corp., Microsoft Corp. and the public-domain Apache server.

The company also expects this summer to roll out Lotus Domino Mail, a server just for electronic mail, calendaring, scheduling and discussion groups.

"[IBM is] looking at some real serious back-end electroniccommerce products, not rinkydink storefront products." — Chris Stevens, Aberdeen Group

"It sounds like Lotus Go will be a stripped-down Web server, and I see a demand for that," said Lotus user Steve Haggerty, a senior manager at Ernst & Young in Westlake Village, Calif.

Many companies buy Web servers and add application functionality by handcoding scripts, whereas Notes and Domino provide the same functionality more gracefully, he said.

But the announcement is a bad idea, according to Gilad Ben-Yosef, a Notes consultant in Chicago.

"If they are just offering a strippeddown [Hypertext Transport Protocol] server, what sets them apart?" Ben-Yosef said. "If you fragment your products too much, you confuse the customers. They should focus on the core product [Domino] and enhance that."

"The whole problem is that Lotus has this really robust and mature product that is integrated with open standards, and by stripping big pieces of functionality out, they are getting rid of the advantage they have," he said.

ADVANTAGES

But other users said IBM has advantages over its competitors in connecting the enterprise to the Internet because of its mainframe heritage.

"They're looking at some real serious back-end electronic-commerce products, not rinky-dink storefront products," said Chris Stevens, an analyst at Aberdeen Group, Inc. in Boston.

IBM attracts users who are otherwise fearful of Internet security threats.

"When we surveyed people who use our site, we found out that security was a major concern for them. Our site deals with sensitive medical information, so that's not a surprise," said Ian Sutcliffe, president of Mediaconsult.com, a Boston-based site that offers medical information online.

"We asked them which computer vendor they had the most confidence in, and IBM came out on top," he said. □

Because memory should be the furthest thing

from your mind.

That's why

there's VisionTek.

Choosing the right path in today's changing client/server world isn't a no-brainer. The decisions you make today can put your IS organization on track for the future. Or saddle you with the wrong technology for years to come.

So if you haven't had time to think about your memory vendor lately, we understand. Actually, that's why we specialize in memory for corporate IS. To take you beyond OEM-quality products at fair prices. And give you ideas and expertise that make memory management so easy you won't have to think about it.

That means keeping you current on market forces that will affect your hardware budgets. Tailoring buy-back programs to help you upgrade more economically. Helping you cut downtime with loaners, no-hassle RMAs and same-day shipping. And more.

When you spec VisionTek, you get the attention, service and flexibility that giant vendors simply don't offer. All tailored to your IS needs. And in these times, that's one choice you can be sure about.

Call your authorized reseller or 1-800-781-4088.

more than memory

visiontek





http://www.ujajantak.com @ 1007 MajanTak





On the one hand, you need cable.
On the other hand, it better be

reliable.

Need a hand?

Nathantel Stathum and the team at Bell Labs are ready to lend a hand

SYSTIMAX® Structured Cabling Systems are one of the most proven premises network backbones in the world. Our fiber optic, copper, and wireless solutions exceed industry (TIA/EIA) standards. Real world testing, with real applications, helps prevent costly down time. Bell Labs innovations. Global installation and support. Unsurpassed 15-year Warranty. When would you like us to start?

CONSULTING SOFTWARE SHARING SERVICE



Sybase users offered help

By Sharon Gaudin

CYRANO, INC. plans next month to offer a migration program designed to assist Sybase, Inc. customers with their mandatory migration to SQL Server Version 11, Computerworld has learned.

The Cyrano System 11 Migration Plan includes two previously available automated testing tools, on-site training and a written methodology.

Sybase is hailing the package as a way to ease the burden of the migration, which is affecting thousands of its customers. Sybase also has embraced other companies such as AstraTek Corp. and CAST Software, Inc., which will handle other parts of the migration issue.

TIME RUNNING OUT

The programs are aimed at Sybase users who are under the gun to upgrade from old releases before the Emeryville, Calif.-based database maker pulls support for them by mid-1998. (See related story, page 47). Newburyport, Mass.-based Cyrano will deliver its bundled program next month, said Deborah Breen, director of marketing.

"We've used products like this previously, and they were greatly helpful," said Terence Light, manager of systems development at Winnipeg, Manitoba-based United Grain Growers Ltd., an agribusiness that annually moves more than \$2 billion worth of grain. "It's a big job just to go through and identify

and streamline what the problems are."

Light, who stores inventory and market pricing information on Sybase SQL Servers at 200 grain elevators across Canada, said his developers already have the migration problem in check and won't need any tools. But he added that if they weren't so far along, buying tools would be on the top of his list.

Sybase alerted its customers in January that support for Ver-

sion 4.9.2 would end by July of next year and that support for Ver-

sion 10 would be cut off next January. Six-month extensions are available for large customers unable to make the change in time. Those two releases shipped prior to Version 11, which Sybase released in late 1005.

Sybase estimates show that SQL Server, across all versions, has about 41,500 directly supported customer sites. Specific numbers weren't available, but Sandra McFarland, senior manager of migration programs at Sybase, estimated that about 70% of those customers have already migrated.

For those customers that haven't, Cyrano's package, which has a list price of \$25,000, was designed to help them find the little surprise problems that other users had already complained about at a recent Sybase user group meeting. After the glitches are found, the users' database analysts make the fixes.

□

Oracle app users share migration tips

► Start early, go slow, check custom apps

By Randy Weston NASHVILLE

MIGRATION WAS the hot topic at last week's Oracle Applications User Group conference here, in light of Oracle Corp.'s plan to drop support by the end of next year for software that isn't year 2000-compliant.

Oracle's decision means that users of its application package who don't have the latest version, 10.7, must upgrade. Users said moving from an ear-

ly version of the software is relatively simple, but moving from a point version can

more current point version can be difficult.

"Going from [Release] 9 to [Release] 10 is a significant amount of work," said Cynthia Sutherland, information systems program manager at Sequent Computer Systems, Inc. "You must treat it as a new implementation — it's that complicated."

LENGTHY PROCESS

A migration could take as long as a year or more because of the following factors:

■ Users will need to upgrade the database because Release 10 needs twice the database capacity as Release 9.

Users also will need to train end users on new functionality, add hardware, test and possibly rewrite custom applications and redesign tables throughout the manufacturing module.

Users may be tempted to rush an implementation to beat the deadline. But Oracle officials Suggested migration schedule for Oracle application users

Time	Event
Month 1 to 2	 New product training Project planning First test upgrade
Month 3	 Hardware upgrade Unit test Data cleanup Second test upgrade
Month 4 to 5	System customizationThird test upgrade
Month 6 to 8	Business process re-engineering (BPR) identified System customization More test upgrades
Month 9 to 10	• Stress test • Training developed and delivered • BPR starts
Month 11	Dress rehearsal upgrade Production upgrade Final BPR

and users advised against that.

Sutherland said her company migrated too hastily from Version 8.4 to 9.3.7. Problems arose because her team "blindly ported all customized applications," which made them miss opportunities to evaluate whether much of the old customization was still needed and to add more customization.

Thoroughly testing the upgrade, especially custom applications, is key, said Debi Schrader White, principal programmer/analyst at In Focus Systems, Inc., a maker of multimedia projection devices in Wilsonville, Ore.

She stressed that testing is an important piece of the upgrade. And she also recommended combing through custom applications to make sure only what is needed is moved to the new system and to evaluate which new custom functions should be built.

Users also must ready the custom applications for the year 2000.

UPGRADE FIXES

Many users wrote customized applications containing two-digit year fields, White said. When they upgrade to the later version, they need to rewrite those pieces to handle four-digit fields.

Richard Cross, an implementation consultant at New Alliance Corp. in Greenwood Village, Colo., said custom applications usually eat up a lot of time. He also said training issues need to be addressed early.

Xerox punches up digital copier line

By Barb Cole-Gomolski

HOPING TO MUSCLE in on the turf of network printing leader Hewlett-Packard Co., Xerox Corp. last week announced a line of copiers that can be upgraded to fax, scan and print documents.

The new Xerox copiers can be connected to PCs using Xerox software that will let users manage document jobs across corporate networks. Down the road, the Stamford, Conn.-based company plans to offer a World Wide Web-enabled version of

the software in a bid to extend its reach to intranets and the Internet. HP's office printers don't have faxing and copying capabilities.

"We expect that [this bundled approach] will be cheaper than buying these devices individually."

- Ron Rakestraw, GSA

But the add-on that will let the Xerox copier print isn't available yet, and Xerox hasn't announced pricing.

The four new Document Centre Digital Copiers are expected to appeal to companies that wish to replace old-style copiers

with digital systems and add fax, printing and scanning capabilities in a piecemeal fashion as their older fax machines, scanners and printers break down. The line will

also ensure that companies deal with one supplier for maintenance of these devices.

"We expect that [this bundled approach] will be cheaper than buying these devices individually," said Ron Rakestraw, information technology project manager at the U.S. government's General Services Administration (GSA) in Atlanta.

Some of the features of the new copier line — such as the ability to print and scan the fronts and backs of documents — will help the government agency meet its paper-reduction goals, Rakestraw said.

Other beta testers said the new machines make much higher-quality copies than today's copiers.

Xerox already offers digital

copiers, but they are costly machines largely aimed at print shops. The new units — which start at around \$9,000 — are about 10% more expensive than old-style copiers. Printing, faxing and scanning may be added through modules that will be sold separately and are expected this fall.

John Dunkle, president of Workgroup Strategic Services, Inc., a market research firm in Portsmouth, N.H., said he expects the modules' pricing to be on par with high-end office machines. "The fax module will probably cost about as much as a high-quality, stand-alone fax machine." Dunkle said. □

we're proud of the company we keep.

Maybe That's Why So Many Companies Keep Coming To Us.

The list of Informix partners reads like a veritable Who's Who of information technology. The unquestioned leaders in solutions for business. Why do they come to Informix? Because they, and thousands of customers worldwide, know they can look to Informix to help businesses run

from OLTP to Data Warehousing to electronic better. With proven solutions for everything commerce, the internet and intranet, workgroups and beyond. For performance, for innovation, the biggest names in the business count on Informix every day. And you can, too.

Baan

INFORMIX° Unleashing Business Innovation[™]

www.informix.com

More mobile users shoulder NT laptops

By Mindy Blodgett

DON'T TELL Fred Winograd that Windows NT wasn't made for laptop computers.

For the chief information officer at Montgomery Securities, Inc. in San Francisco, the decision to deploy Windows NT Workstation 4.0 on 350 Digital Equipment Corp. laptops made

perfect sense. The firm was switching from Apple Computer, Inc. Macintoshes and Power-Books and rebuilding its desktops from scratch, Winograd said.

"We had decided to go with Windows NT on servers and desktops, and we wanted to standardize," he said. "It is hard enough to support a mobile user; if I

had to put together a staff with both Windows 95 and NT expertise, it would have made life more difficult."

NT HITS THE ROAD

Winograd isn't alone. Despite the fact that Microsoft Corp.'s Windows NT operating system lacks power management and modem support features — making it a poor laptop operating system — laptop vendors said a rapidly increasing number of users are taking NT on the road anyhow.

For example, Digital officials

estimate that as many as 15% of the company's laptop customers run NT, and IBM PC Co. sets the number of its corporate laptop clients that run NT at 20%. Officials at both companies said the numbers are growing.

According to International Data Corp. in Framingham, Mass., 0.7% of the laptops that shipped last year run NT. That

percentage is expected to jump to 3.3% this year and to 10.8% by 1999.

The reason is standardization — users who move to NT on the desktop figure they might as well run NT on their laptops. Also driving the mobile march to NT is the allure of the security provisions built in to NT but lacking in Windows

95. And many users who want NT on laptops aren't willing to wait until the mid-1998 release of NT 5.0, which promises mobile support such as true hot docking.

"Standardization and the more secure operating system were what we liked about NT on laptops," said Steve Sommer, vice president of information systems management at New York law firm Hughes, Hubbard and Reed.

But providing NT on laptops isn't easy, according to users, analysts and industry observers.

Several laptop vendors, in-

cluding Digital, IBM PC Co., Compaq Computer Corp., NEC Technologies, Inc., Dell Computer Corp. and Toshiba America Information Systems, Inc., offer NT preloaded on laptops.

MISSING STANDARDS

To do so, the vendors have had to create proprietary extensions and special drivers to make up for NT's missing mobile features, such as the ability to gauge battery life. The lack of standard drivers particularly troubles industry analysts and some users.

"While there are some patches out there, they are all proprietary," said Martin Mortenson, an analyst at Gartner Group, Inc. in Stamford, Conn. He said that if the driver breaks down, "you are back to square one."

In addition to the hardware vendors, some peripheral developers have stepped into the breach. For instance, System-Soft Corp. has developed NT versions of its CardWizard and Power Profiler PC card products. Phoenix Technologies Ltd. has released a similar product.

But Ken Dulaney, an analyst

at Gartner, said the consultancy advises users to stay away from the current NT laptops.

"All the software available for 95 is not available for NT. Some shops think that standardizing will cut costs of ownership, but the increased support calls you get with NT takes that away," he said. Dulaney said that only users who want security should consider running NT on laptops.

"From everything we have read and heard, Win 95 is better for laptops," said Kevin Danehy, manager of workgroup applications at Millipore, Inc. in Bedford, Mass. "The support headaches [for Windows NT] would be higher. I just don't see the henefits."

Portables go ultralight and superheavy

CONTINUED FROM COVER 1

electronic mail and word processing tasks.

Slated to hit the market around Comdex/Fall '97, many of these machines will run Microsoft Corp.'s Windows CE operating system. Costing \$1,000 to \$1,500, they fall into a market niche somewhere between laptops and handheld PCs.

On the high end are desktop replacements that weigh up to



Some mobile users want no more than the E-mail and writing abilities that uitralight portables offer

Xerox's Mike Radigan

Storage management software out

Win 95 is good for

for Win NT may be

laptops; support

By Matt Hamblen

LEGATO SYSTEMS, INC. last week announced 22 products designed to help administrators of even the largest distributed server networks store data and manage storage devices.

The Palo Alto, Calif., vendor said it will ship the products this year to implement its Global Enterprise Management of Storage (GEMS) strategy announced last fall. The products include online backup utilities and a Javabased console for managing enterprise storage devices.

Northern States Power Co. in Minneapolis plans to purchase at least two of the software products in the coming months to cut data backup time in half, among other reasons, said Burt Loveland, an on-site consultant at Northern States Power.

"We're interested in virtually everything they announced," Loveland said.

For example, Legato claims that an eight-hour daily backup job can be cut to four hours with GEMS to software, he said.

GEMS 1.0 will be available next month for \$3,995.

Also, Loveland said he wants to obtain NetWorker 5.0 for Windows NT, IBM's AIX, Hewlett-Packard Co.'s HP-UX and Sun Microsystems, Inc.'s Solaris. Networker is software that connects multiple server platforms with multiple storage devices. It will be available in the fourth quarter. □

12 pounds and boast 15-in. screens, which makes them more like "luggables" than portables, industry observers said. These \$6,000 beasts will target power users who run hefty graphical applications.

Compared with today's desktop replacements, these highend portables will offer faster processors — the Intel Corp. Pentium 200-MHz mobile chip is expected this year — screens almost equal to those on standard PCs and much bigger hard drives, according to analysts.

Mobile users are finding more handhelds on market.

"With the ultra-subnotebook market, I think the vendors are finally catching on to what users are looking for," said Tim Bajarin, an analyst at Creative Strategies, Inc. in San Jose, Calif. "These are almost mobile network computers [that function as] E-mail and writing devices, using the Internet for access."

User Mike Radigan, a program manager at Xerox Corp. in Rochester, N.Y., said the thinner client is the way to go. "At a cheap enough cost... with lighter weight and more functionality... it could be a monster development for mobile," he said.

"The lightness and battery life sound very appealing," said Jim Snively, a systems consultant at Sun Oil Co. Refining Market in Philadelphia.

And Andrew Seybold, editor of "Outlook on Communication and Computing," a newsletter in Boulder Creek, Calif., said, "These will allow people to write from the road and get their Email — the two things users need most of all. I call them Email machines, and I have been looking for them for a long time."

The high-end laptops, which are expected to ship between June and year's end with 13- to 15-in. screens, will appeal "mostly to engineers and those who need heavy-duty graphical use in vertical markets on the road," Bajarin said.

But Frank Delargy, information systems manager at Polaroid Corp. in Waltham, Mass., expressed interest. "Some people do heavy-duty imaging applications, and they would love to be more mobile. They might like these luggables," he said. Laptop vendors expected to release ultra-ultraportables this year include IBM PC Co., Toshiba America Information Systems, Inc. and NEC Technologies, Inc. (see story below).

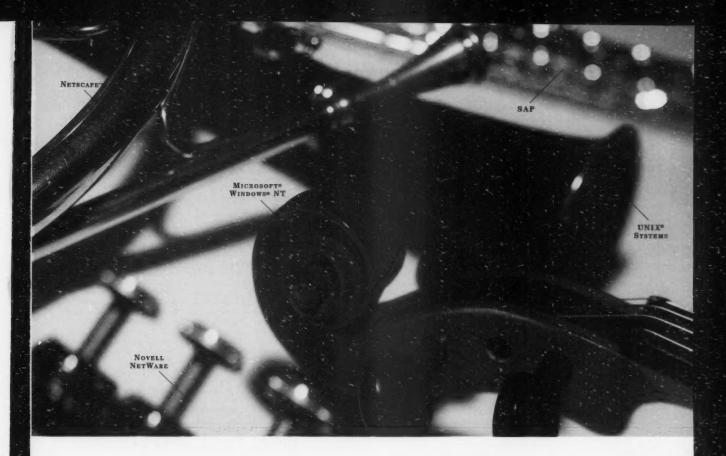
Analysts said IBM PC plans in the next two months to ship desktop replacement laptops that feature a 13.1-in. screen and 3Gbyte hard drive. They will cost between \$6,000 and \$6,500.

Crossing the ocean

Two of the new laptops will be versions of products already on the market in Japan. Those include the following:

■NEC Technologies in Itasca, III., will release an ultra-ultraportable at year's end, according to sources. Code-named Livingston, the device will be similar to Mobile Gear, a DOS-based handheld PC with a built-in 14.4K bit/sec. modem and 16.5mm keyboard that NEC has been selling in Japan. Livingston will probably support the next version of Microsoft's Windows CE operating system, due this fall. NEC also plans to release an ultraportable notebook this summer with a 150- or 166-MHz Pentium MMX processor and a 12.1-in. screen *Toshiba America in Irvine, Calif., is due to announce Libretto, a mini-notebook that

Calif., is due to announce Libretto, a mini-notebook that runs Windows 95. The notebook, which is also sold in Japan, weighs less than 2 pounds and has a 6.1-in. color screen and a Pentium processor. — Mindy Blodgett





Running a business today demands a flexible, open environment. Supporting one demands a global, knowledgeable organization. And no one has more experience integrating and managing today's best technologies than HP Services and Support. With our hardware, software and networking expertise, we provide a single source for complete computing support so you can implement technology quickly and run it harmoniously. For more details, visit us at www.hp.com/go/4service.



Proxy servers gain user appeal

▶ Microsoft, Netscape battle for top market spot

By Laura Di Dio

CORPORATE INTERNET users increasingly are turning to proxy servers to ease bandwidth demands, reduce leased-line costs and improve security.

The two leaders in this market are Microsoft Corp. and Net-

scape Communications Corp. IBM and Novell, Inc. are developing products that will ship in the next six to nine months.

Bob Sakakeeny, an analyst at Aberdeen Group, Inc. in Boston, said the demand for proxy servers has soared in the past eight months, as companies have embraced the Internet.

"This is yet another market segment where Microsoft is going head-to-head with Netscape," Sakakeeny said.

Microsoft and Netscape proxy servers — each priced at \$1,000 — act as secure gateways that enable businesses to deploy a single dedicated machine for Internet access by dozens or hundreds of users. The servers also provide intelligent caching for

faster data access and minimize bandwidth overhead during peak usage.

The Netscape and Microsoft proxy servers have similar functionality. The main differences to date: Netscape's Proxy Server has been shipping for two years and offers greater scalability running on high-

end Unix servers such as Sun Microsystems, Inc.'s Solaris.

Microsoft's Proxy Server provides better integration with Windows desktops and applications. And Microsoft's Proxy Server supports a wider range of network connections to online services, 'Telnet and newsgroups.

Proxy servers have limitations. Unlike more expensive stand-alone firewalls, which range in price from \$5,000 to \$50,000, proxy servers don't deliver sophisticated event statistics, reports, alarms and audit tracking.

Eric Senf, webmaster and systems engineer at Krause Publications, Inc., a publisher of collector and trade publications in Iola, Wis., picked Microsoft's Proxy Server over Netscape's offering.

He said it let his firm "proxy all types of network connections" such as User Datagram Protocol for real audio, live videoconferencing and access to online services such as America Online and CompuServe.

"Netscape's Proxy Server works well, but it only lets you establish basic [file transfer protocol], [Hypertext Transport Pro-



Company has reduced support and administration costs by up to 50%

tocol] and Gopher connections,"
Senf said.

COST SAVINGS

The Proxy Server's close integration with Windows NT Server has allowed Harrah's Entertainment, Inc. in Reno, Nev., to reduce support and administration costs by up to 50% for its 22,000 users at 17 gaming sites, said Robert Wilkins, the company's systems manager.

"Microsoft Proxy Server's caching capability gives our end users a 25% gain in access time over the existing 256K bit/sec. link without requiring an upgrade to a T1 line," he said.

"You can't put a dollar value on integration," agreed Paul Elswick, a technical consultant at the Lee County School System in Virginia, which has used Microsoft's Proxy Server since the beta shipped last June. It lets the school centrally manage Internet access for 4,200 students and 340 teachers in 13 Kthrough-12 schools with just two network administrators.

"And it enables us to cut our monthly bandwidth costs from \$10,000 to \$5,000," Elswick said.

Microsoft's Proxy Server also features a filtering capability that lets the school system block student access to inappropriate or pornographic World Wide Web sites.

Netscape's Proxy Server also has plenty of proponents. Ed Glassman, director of technology strategy at Pfizer, Inc. in New York found Netscape's Proxy Server was more mature and scalable than Microsoft's.

"It's not a healthy thing to bet your business on 1.0 software. Also, we use the Netscape Proxy Server running on a Sun Solaris server to cache 5G to 10G bytes of data per day. We didn't feel Microsoft's Proxy Server met our capacity requirements," Glassman said.

Scalability concerns

"Netscape's Proxy

Server works well.

but it only lets you

establish basic con-

nections'

CONTINUED FROM COVER

following

The forthcoming 64-bit versions of Windows NT Server, which will be based on Digital Equipment Corp.'s Alpha processor and Intel Corp.'s Merced chip. The support for NT on the Alpha processor is due in the middle of next year, about the same time that Windows NT 5.0 is to ship. There is no scheduled shipping date for an Intel Merced version of Windows NT Server. The 64-bit architecture is able to support performanceboosting features such as very large memories and large file sizes.

The upcoming eight-way Wolfpack clustering and 16-way symmetrical multiprocessing server software for Windows NT, due in 1998 or 1999.

Some signposts, although not a complete road map, to Microsoft's publicly stated plans to meld Windows 95 and Windows NT into one operating system kernel, according to sources close to the company.

It is too early to speculate on the exact packaging of NT Server 5.0 or beyond, said Mike Nash, Microsoft's director of marketing for Windows NT Server.

"We will support 64-bit addressing on both Digital's Alpha and Intel's Merced. We will deliver 64-bit Alpha addressing in the Windows NT 5.0 time frame. And we'll announce our exact release schedule for Merced when that chip gets delivered," he said.

Clusters distribute processing among multiple servers. That lets businesses create highly scalable, fault-tolerant and more easily managed networks with no single point of failure.

TOP GUNS

Many of the top Unix vendors, including Digital, Sun Microsystems, Inc. and Silicon Graphics, Inc. (SGI), already ship products that use a 64-bit architecture.

Sun and SGI recently incorporated interconnect technology from supercomputer vendor Cray Research, Inc. into their Unix servers.

The interconnect technology lets their Unix servers scale significantly beyond current levels. Sun's recently announced Ultra-Enterprise 1000 scales to 64 processors from a previous high of 30.

Windows NT's inability to effectively use more than four processors has become a sticking point because Unix servers can comfortably support up to 64 processors without suffering a 30% to 60% performance hit.

"Worse yet, Windows NT 4.0 has no directory scalability because there is no Active Directory yet," Kastner said.

Already a year late, Active Directory is due in the middle of next year, according to Microsoft officials

Kurt Guerrero, a network administrator of 65 Windows NT servers at Northern Trust Co. in Chicago, said getting Wolfpack clustering is more crucial for the bank.

"I hope this scalability day gives us some concrete product road maps and product ship dates. We need Wolfpack now," Guerrero said.

But Neil MacDonald, an analyst at Gartner Group, Inc., said it will take Microsoft many years to close the scalability gap between Windows NT Server and Unix servers.

"Let's face it," MacDonald said. "We won't see the second and most important phase of Wolfpack — clustering among eight processors and beyond — until late 1998 or 1999. That doesn't solve users' current scalability issues."

Check Point makes firewall security's Grand Central

By Sharon Machlis

CHECK POINT Software Technologies Ltd. today will unveil details of an alliance aimed at making a wide range of security products operate together with its FireWall-1 software.

The idea is to have everything from virus-scanning to intrusion-detection software work together at the firewall, which is the access control point where companies protect an internal network from the outside world.

Policies for all those tools — such as which incoming files to scan and what constitutes suspicious activity — could then be set at the firewall's single administrative console. The data logs from various security software also could be consolidated.

CENTRAL POINT

"If it works, it would be great," said Richard Perlotto, corporate IS manager at VLSI Technology, Inc. in San Jose, Calif. "It's something that's needed.... There's no centralized method [now] of managing all the data."

Alliance partners include switching firms such as 3Com Corp., Bay Networks, Inc. and Xylan Corp.; antivirus vendors such as Cheyenne Software, Dr. Solomon's Software, McAfee Associates, Inc. and Symantec Corp.; and intrusion detection firms Haystack Labs, Inc. and Internet Security Systems.

The group also includes authentication vendors such as Axent Technologies, Inc., Secure Computing Corp. and Security Dynamics, Inc. and encryption specialist RSA Data Security, Inc.

The initiative, called Open Platform for Secure Enterprise Connectivity, features application programming interfaces and a scripting language to help developers integrate their products with Check Point's.

With an estimated 44% share of the firewall market and strong marketing, Check Point has the clout to draw in major vendors across the security industry, said Marlo Kosanovich, an analyst at Meta Group, Inc. in Stamford, Conn.

Check Point, in Lexington, Mass., will offer testing and certification for plug-and-play compatibility with FireWall-1. □

save Name over 73%* Title		Address Shown: Grome Busine New Granew
Company E-mell address Street		"Single copy price \$3.00/feasus U.S. Cely, Carada \$95, Carada \$95, Meadoo, Central/South America \$150, Europa \$206, all other countries \$207 Porsign orders must be
City/State/Zip		prepaid in U.S. dollars.
BUSINESSANDUSTRY (Circle care) Manufacture (other han computer) Financializatione (other han computer) Financializatione (seal Estate) Medical/Law/Education Wholessan/Rebull/rad Business Service (except DP) Government - State/Factional/Local Government - State/Factional/Local	Please complete the questions below. 2. THI EMPACTION (CRUSS one) manuscript MANAGEMENT 18. Chief Information ("Microfice President" Ass. LY SIASSOP Management 2. Dr. My. MS Services, reformation Carrier 2. Dr. My. MS Services, reformation Carrier 2. Dr. My. More of Dys. Data Fela. Comm. Administration Service Plearing. Administration Service Plearing.	12. Vice President, Asst. VP 13. Tressurer, Controller, Financial Offic DEPARTMENTAL MANAGEMENT 51. Sales & Midg, Management 70. Medical, Legal, Accounting Mgt. OTHER PROFESSIONAL MANAGEME 80. Information Centers/Libraries, Educa Journalists, Students

					11111		
						NO POSTAGE NECESSARY IF MAILED	
					111111	IF MAILED IN THE	
						UNITED STATES	
			BUSINES	C DEDIV	MAH		
			ST CLASS MAIL PE				
		1		BE PAID BY ADD			
			COMPIL	TERWORLD			-
			PO BOX	(2044			18
			MARION	OHIO 43306	-2144		
							- 6
			1,1,.1		ռևևուՄւհոհվուն	ы	

Oracle user group show tries to go it alone

▶ Focus is on technical education, not products

By Craig Stedman

ORACLE CORP.'s database user group next week will try to put on a better conference than the ones Oracle has started to run itself.

But officials at the Chicago-based International Oracle Users Group-Americas (IOUG-A) acknowledged the group is fighting against the proliferation of Oracle-controlled conferences.

Attendance at the IOUG-A's event in Dallas is expected to be about one-third of what it was at the last gathering in the fall of 1995, when Oracle and the user group still worked together on a single annual conference.

The IOUG-A canceled last year's conference after the two sides settled a nasty dispute by agreeing to run separate U.S. shows. Oracle would produce its own OpenWorld in the fall, and the user group would switch its show to the spring.

BY THE NUMBERS

Attendance figures from recent Cracle database conferences Conference Number of paid attendees International Oracle 4,300 User Week '95 (Philadelphia, September 1905)

September 1995)
Oracie OpenWorld 5,000
(San Francisco,
November 1996)

International Oracle User Week '97 (Dallas, April 1997)

* Expected attendance

"There's still a lot of confusion among the user community about the differences between us and OpenWorld," said Michael Abbey, an IOUG-A vice president who works as a database consultant in Ottawa. Holding the show in the spring after 14 years of fall conferences is also "a big change," he added.

Oracle will exhibit and give keynote speeches and presentations in Dallas, 'but we haven't had a huge amount of dialogue with them over this conference,' Abbey said. The IOUG-A wants to focus heavily on technical education "rather than new products and hype," he said.

Hugh Allan, manager of information technology at Dunlop Tire Co. in Amherst, N.Y., said he would rather see that kind of conference, as opposed to one in which Oracle is "putting on a major marketing blitz." But he said Dunlop isn't sending anyone to Dalias.

"I want to see how the first conference goes without Oracle's involvement before I'm willing to invest in it," Allan said. "It was hard to justify the cost of going this time."

Bob Cook, manager of database administration at the American Hospital Association in Chicago, also isn't heading for Dallas. The hospital association put most of its education money into direct Oracle training this year, and the advent of separate conferences is confusing, Cook said.

"I don't have a feel for which one is better, and I definitely don't have the money to attend both," Cook said. "I

kind of liked it the way it was before."

Whether the IOUG-A can profit from the Dallas conference remains to be seen, Abbey said. "It depends on how much walk-in business we get."

Oracle isn't expected to announce any major new products at the IOUG-A conference, although the executive in charge of developing the upcorning Oracle8 database is due to give a "technology update" keynote speech.



Servers are the subject, and your ability to roll out and support them expertly is the result when you consult the MICROSOFT® BACKOFFICE RESOURCE KIT, Part One and Part Two.

Part 1 covers Microsoft Exchange Server—the backbone of a business communications system, and Microsoft Systems Management Server—the network management tool for enterprise-wide software deployment of new applications or utilities. The extraordinary scalability of both these servers makes the Microsoft BACKOFFICE RESOURCE KIT equally valuable whether you're supporting organizations of 10 or 10,000.

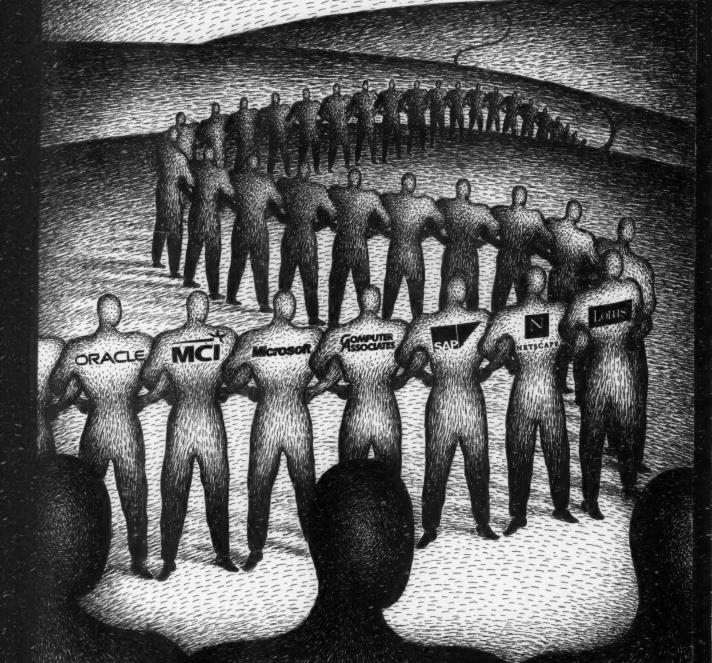
Part 2 of the MICROSOFT BACKOFFICE RESOURCE KIT covers Microsoft SQL Server 6.5—Microsoft's ultrapowerful database tool—and also includes additional content on Systems Management Server and Microsoft Exchange Server.

Written in cooperation with the Microsoft BackOffice development team, the Microsoft BACKOFFICE RESOURCE KIT Part One and Part Two, from Microsoft Press, are the essential resources that you need to serve up Microsoft BackOffice to your organization. They're at your favorite bookstore or computer software store.

Microsoft Press

Available in quality bookstores and computer stores worldwide. To locate your nearest source for Microsoft Press® products, reach us at 1-800-MSPRESS in the U.S., or at mspress.microsoft.com





In business, the lone wolf is a vanishing species. No single company has all the answers.

Which is why Digital offers you not merely the world's fastest 64-bit servers.

But one of the most formidable arrays of allies and partners in all of computerdom. Digital and Microsoft* have allied to bring Windows NT* and BackOffice* solutions to your entire enterprise. Digital and Oracle* offer record-shattering performance, transforming databases and busi- Not only are ness applications into potent DIGITAL AlphaServer systems powerful. competitive weaponry. Computer Associates* teams with Digital to deliver unparalleled expertise in mission-critical They also have enterprise management solutions.

powerful friends.

Together, SAP™ and Digital offer business application solutions, for a better return on your information. Then again, your solution might be a fully integrated computer/telecommunications system from MCI® and Digital. Or Internet and intranet technology from Netscape™ Communications and Digital. Or Web-enabled enterprise applications from Lotus® and Digital. In fact, Digital has thousands of partnerships, with one singular result. AlphaServer™ systems promise not just raw performance. But a practical, powerful business edge. Call 1-800-DIGITAL, ext. 266. See us at www.ads.digital.com/friends. Begin to make our partners—and the Digital edge—your own.



Squabbling agencies endanger year 2000 work

By Patrick Thibodeau COLORADO SPRINGS

THE TECHNICAL FIX for the year 2000 problem isn't what bothers state technology officials. It's getting squabbling state agencies and politicians to agree on a plan.

In that light, Michael M. Benzen has made it to the top of information technology's equivalent of Pikes Peak. Or so it seemed to those attending the National Association of State Information Resource Executives (NASIRE) conference held here earlier this month at the foot of the Rocky Mountains.

As Missouri's chief information officer, Benzen has persuaded various state departments to work together on the state's \$57 million year 2000-compliance effort. "It doesn't make sense for everybody to go to the slaughterhouse individually," he said.

Without a unified approach, costs are

likely to rise, political support will be tenuous and the project will be unmanageable as agencies veer off in different directions, officials at the conference said.

Benzen said coordinating the task among state agencies paid off for his group: The governor included the money in his budget, and the state House of Representatives approved it. If the state Senate acts favorably in several weeks, as expected, Benzen will have scaled his year 2000 summit.

PRESSING PROBLEM

Most states aren't that far along in addressing the year 2000 problem, said Curt Pederson, the CIO for the state of Oregon in Salem.

With fewer than 1,000 days before the year 2000, the so-called date-change bug has become a pressing concern for NASIRE members.

"What we're talking about here is a managed catastrophe," said NASIRE President Carolyn Purcell, executive director of the Texas Department of Information Resources in Austin.

Several state officials said getting agencies and elected officials to agree on the project methodology — and then fully executing each phase along the way — may be more important than the selection of software tools.

THE TOP 4

A key part of New York state's coordination effort was to create a list of the top 40 programs that must be fixed, said Camaron Thomas, director of the state's Task Force on Information Resource Management in Albany.

But reaching agreement among state officials wasn't simple, Thomas said. "We had one individual who was absolutely insistent that her deer management program should take greater priority over the bridge management program," she said.

Although New York budgeted \$50 million for year 2000 compliance, "we don't think it's anywhere near what we will need." Thomas said.

And year 2000 efforts in New York still haven't won support from legislators, Thomas said. □

A STATE OF MIND

A yet-to-be-released U.S. Department of Health and Human Services report will show:

- 66% of the systems that manage state human services are more than seven years old
- Every state will have to upgrade and/or install new systems to comply with welfare reform
- 32% of the states have completed a year 2000 assessment

BLURRED
ELEPHANT RIDING A SCREAMING
ACROSS GLEPHANT ON ROLLER LADES
BONNEY LLE
SALT FLATS.

We wanted to tell you how our rapid access to large amounts of data maximizes your computing investment (without putting a majestic beast through the indignities of a photoshoot).

Who needs visual cliché when you've got the world's fastest, most reliable, high capacity storage

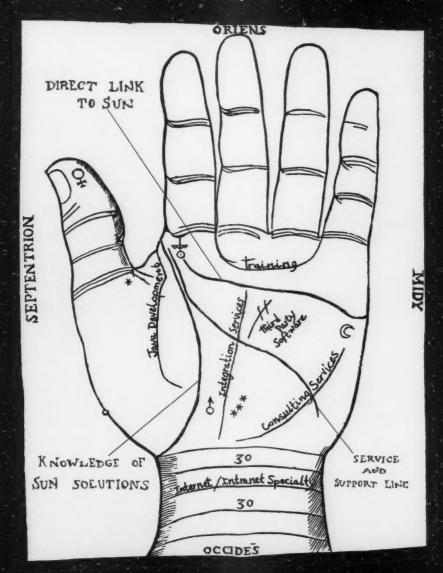
solutions? The fact is, MAXSTRAT Gen5 storage servers are scalable to over 800 gigabytes. That's ten times more capacity than other enclosures. Here's the fast part: a data transfer rate of 250 megabytes per second. Which is 15 times faster than competing storage products. **Gen5 is serious centralized storage. **When it comes to today's data-intensive applications, no other solution delivers better throughput and access for leading platforms including Sun, SGI/Cray, Fujitsu, NEC and IBM. Clearly, MAXSTRAT sets the new storage standard. **\text{V} in some ways, we're like a storage investment protection policy. You see, thanks to MAXSTRAT's compatibility, the Gen5 only gets better if you change or add workstation or supercomputer suppliers. **\text{V} What makes us the ideal solution? Maybe it's because storage is our ONLY business. We're the specialists. Which brings to mind a few visual possibilities like

a...nah, we'll spare you. 3: To get the most out of your computing investment, call us at 408-383-1600.



MAZ(STRAT

Your future lies in the palm of their hand.





OR Wagnesh Community Orthogo

Sub Certified Resellers are your direct link to Sun. They're the ultimate resource for customizing Sun solutions to fit your business. And they'll keep those solutions running smoothly, with unmatch, a service and support. Every Sun Certifical Reseller is trained within

their sertification category – Enterprise, Workgroup, or Specialty. So look for the Sun Competency Certification logo when selecting your business solutions. Because when you get a hand from a Sun Gertified Reseller, you get one very bright future at no extra charge. THE NETWORK IS THE COMPUTER





COMPAQ IS LEADING THE MOVEMENT TO INDUSTRY-STANDARD ENTERPRISE COMPUTING.

WE HAVE THE CHAMPAGNE CORKS TO PROVE IT.

Recently, Compaq shipped its one-millionth server. For one brief moment, the people of Compaq celebrated a vision that, in seven short years, has become a movement.

Each day, more organizations are trusting our PC-based solutions as the lifeline to their mission-critical information. To the point where today, more industry-standard Compaq servers have been sold than those manufactured by IBM, Hewlett-Packard and Digital combined. Compaq servers consistently set new benchmarks by offering the best price/performance, scalability, fault tolerance and-manageability.

In the future, our continued partnerships with companies like Intel, Microsoft, Novell and SAP will ensure our abilityto offer innovative, complete solutions to growing enterprises.

Something definitely worth celebrating,

One million servers sold

#1 in servers

Companies turn to colleges for IS recruits

Another tactic is to retrain current employees

By Julia King

U.S. COMPANIES are scouring college campuses and recycling their own employees to meet the hiring demands of IS departments desperate for technical workers.

Corporate America plans to significantly boost information systems hiring in the next two to three months, a new survey found, and will rely more heavily than ever on college recruits.

Another source of talent is in-house training programs.

Increasingly, large firms are reskilling mainframe and other technical specialists, then redeploying them to work on

client/server and Internet-related projects.

"We're doing specialized training for very hot market skills, such as Oracle database administration, Unix systems administration and project management. That way, we can [redeploy] our own employees rather than rely on the marketplace," said Melody O'Brien, human resources director for IS at US West, Inc. in Denver.

College-level hiring at US West is up a whopping 500% compared with a year or two ago, O'Brien said. US West has about 150 IS job openings, she said.

Overall, U.S. companies plan to increase IS hiring by an average 24% during the second quarter, according to a survey of 1,400 chief information officers conducted by Robert Half International, Inc., a large IS recruiting firm in Menlo Park,

in Menlo Pa

In certain regions and industries, hiring will be even stronger, according to the survey. IS managers in the real estate, finance and insurance sectors, for example, project a 23% increase in

Phillips at Robert Half International.

bypassing their

human resources

departments and

outside technica!

recruitors to reel

in top IS staffers.

says Jeanine

52% increase in hiring.

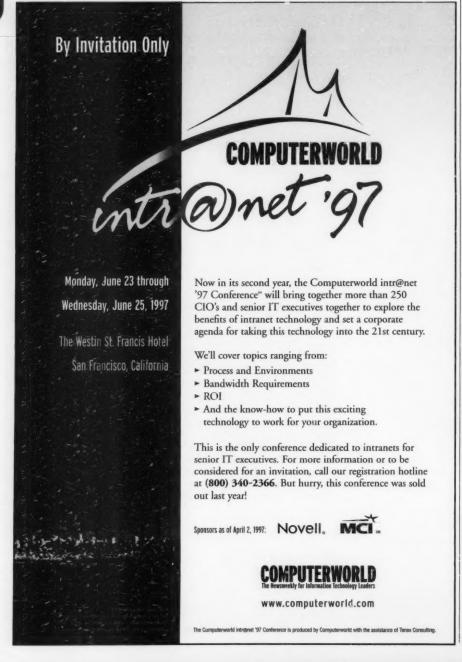
Meanwhile, experienced IS professionals available for hire remain few and far between

Thomson Financial Services, Inc. in Boston is working around the shortage by "hiring more junior people and letting them grow into key IS roles," said Bob Quinn, manager of employment.

That is done by hiring junior IS staffers several months before the scheduled start of a project. In the interim, the staffers are mentored by more experienced software engineers and developers.

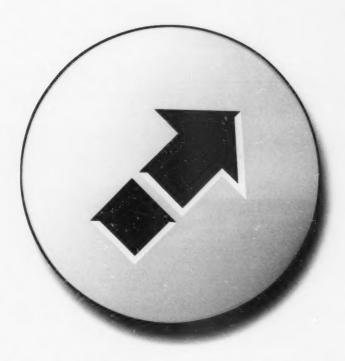
Thomson has about 170 IS job openings, primarily for software developers with Unix, Windows, C++ and object-oriented skills. Oracle database administrators and Unix system administrators are also needed.

"We're hiring people that fit the profile we're looking for, whether we have a defined [job] requisition or not," Quinn said. "We're trying to build bench strength, be ahead of the curve and have people in before there's a crisis situation."





Congratulations Compaq[®] on your millionth server, from one market leader to another. And thanks for a partnership that's always been headed in the right direction.



In the beginning (was it only 1989?) there was the first PC server, the Compaq SystemPro, and the first network operating system for LANs, Novell's NetWare. Since then, Compaq has become the market share leader in network servers while we've accomplished the same in the category of networking software. What hasn't changed is our commitment to work together. Today, our partnership has established a powerful, industry-standard solution based on IntranetWare, that is both scalable and simple to manage. The end result? A reduced total cost for smart Internet technology that's flexible enough to incorporate the future and the next million servers. www.novell.com

Novell.

transaction no. 00389254911

AT 9:00 AM ON JANUARY 17, 1991, OIL LISTED AT \$10.88 PER BARREL. AT 9:01 AM, IT LISTED AT

\$21.44 PER BARREL.

THAT 60 SECONDS IS ALL YOU NEED TO KNOW ABOUT US.

Every second counts. And every second of every day, Tandem[®] systems are trusted to handle 90% of the world's stock transactions, 80% of all ATM transactions, 66% of all credit card validations, and two-thirds of all 911 calls in the U.S. Tandem now brings this reputation in business-critical online transaction processing to a wider range of open, scalable platforms: from our high-performance NonStop[®] Himalaya[®] S-series and UNIX[®] system-based servers to Windows NT[®] Server-based solutions. Because whether you're trading oil or filling orders, every second counts. For our latest information pack, which includes the new Windows NT Enterprise Management Sampler CD, call 1-800-NONSTOP, ext. 8000 or contact us at www.tandem.com

Every second, every transaction, every customer counts.



Introducing JUNET Extranet Services

When UUNET, MFS Communications and WorldCom joined forces, a new business communications capability was born.

For the first time, one of the world's most extensive local fiber-optic infrastructures could be combined with the unmatched reliability and scope of UUNET's global Internet backbone and dial network. The result is the Extended Intranet, or "Extranet." With control of the network end-to-end from your head-quarters to branches and business partners around the world, we can guarantee levels of availability and performance.

Our new Extranet Services, ExtraLink and ExtraLink Remote, give you all the advantages of public or private wide-area networks, including security, plus more secure dial-up access



The accessibility of the Internet with the security of an Intranet.

for remote users. At a fraction of the cost.

And Extranet Services come from the only company that could bring together ail the elements to make it happen.

For naore information, call 1800 465 6819 or visit our Web site at www.uu_net/extranet/co9.



Information you need may be passing you by. Subscribe today!

Yes, I want to receive my own copy of Constituted each week.	Please complete the questions below.
Taccept your offer of \$39.95° per year - a savings of over 73% off the single copy price. PREST MARKE ME LAST HARKE TITLE COMPANY EMAIL ADDRESS ADDRESS ADDRESS ADDRESS STATE ZIP Address Shows: D Home D Business There I Single copy price: \$3.00/fesus \$20.00.00.00.00.00.00.00.00.00.00.00.00.0	1. DUSANESS/NOUSTRY (Circle one) 10. Manufacture (other than 10. Manufacture (other than 10. Manufacture (other than 10. Manufacture (other than 10. Monitorial posture (state 10. Medical Law/Education 10. Monitorial Retail Trade 10. Business Service (sexept DP) 10. Government - State/Federal/ 10. Government - State/Federal/ 10. Mining/Construction 10. Mining/Cons
Information you need may I Ves, I want to receive my own copy of COMPTENSIES each week. I accept your offer of \$39.95° per year - a savings of over 73% off the single copy price.	De passing you by. Subscribe today! Please complete the questions below. 1. Business/NNDUSTRY (Circle one) 21. Dic/log. Mil 5 Services, inflammation Center in Harmanism Center (Circle one) 22. Dic/log. Rehvors Sys. 3. Do you use, evaluate, specify, recommend, purchase: 22. Dic/log. Rehvors Sys.
FIRST NAME WILLIAM WITCE FILLIAM FMAIL ADDRESS AUDRESS AUDRESS AUDRESS AUGRESS AUGRE	20. Flauteolfinaramon/Real Estate 30. Medical/Law/Education 40. Wholesale/Retail/rade 40. Wholesale/Retail/rade 40. Business service (except DP) 60. Government - State/Rederal/ Pacific Utilities/Transportation 40. Wholesale/Retail/rade 40. State of the
	Management you by. Subscribe today!
Yes, I want to receive my own copy of COPTIENDELS each week. I accept your offer of \$39.95* per year - a savings of over 73% off the single copy price.	Please complete the questions below. 1. BUSINESS/MOUSTRY (Circle one) 10. Manufacturer (other than comprise) 20. Finance/Insurance/Real Estate 30. Medical/Macificuration Manufacturer Circle all that apply) Manufacturer Manufa

TITLE/FUNCTION (Circle one)
 IS/MIS/DP MANAGEMENT
 Chief Information Officer/Vice
 President/Asst. VP IS/MIS/DP

COMPUTERWORLD

MANAGEMENT
80. Information Centers/Libraries,
Educators, Journalists, Students
90. Other Titled Personnel

B4D7 Z

App. Dev.Products __J Yes _J No Networking Products __J Yes _J No Intranet Products __J Yes _J No

A. Which of the following products do you buy, specify, recommend or approve the purchase of?

(Check all that apply.)

(a) \(\) Internet software

(b) \(\) Internet browsers

(c) \(\) Web authoring/

CORPORATE MANAGEMENT

11. President, Owner/Partner,
General Mgc.
12. Vice President, Asst. VP
13. Treasurer, Controller, Financial
Officer.

Officer
DEPARTMENTAL MANAGEMENT
51. Sales & Mixtg. Management
70. Medical, Legal, Accounting Mgt.
DTHER PROFESSIONAL
MANAGEMENT

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P O BOX 2044 MARION OHIO 43306-4144 NO POSTAGE NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P O BOX 2044 MARION OHIO 43306-4144 NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES



hladalladlallaadlaaiahadlaladlaladll

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P O BOX 2044 MARION OHIO 43306-4144 NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES



Snafus plague IBM/county deal

▶ Outage exploited in legal battle over outsourcing contract

By Thomas Hoffman

THREE DAYS of computer downtime at a local community college is just the kind of ammunition that opponents of a 3month-old, \$102 million outsourcing contract plan to use in their legal battles to stop the politically thorny deal.

In January, County Executive Andrew O'Rourke hired IBM to take over the bulk of information systems operations in New York's Westchester County under a 10-year contract [CW, Jan. 27]. That same month, a New York State Supreme Court judge ruled that the contract was illegal, because only the county's board of legislators had the authority to allocate funds for the contract.

The county has since been granted a stay by the courts to allow IBM to continue running its IS operations until a decision on the appeal has been reached.

The latest salvo in the ongoing battle is a memo sent by



Mark Gesoff, director of information systems at Westchester Community College (WCC) in Valhalla, N.Y., complaining that WCC is "experiencing enormous frustration" with the county's outsourced services.

Those frustrations include WCC's three-day outage in late March, which was caused in part by IBM's inability to communicate domain name server changes to the college when those changes were made.

Following the computer disruptions, WCC plans to deduct \$25,000 per day "or part thereof" from its services billings, wrote Gesoff, who couldn't be reached for comment.

Gesoff also wrote that he is upset with IBM's plans to move data center equipment in early May when summer registration and processing of grades for the spring semester begin. Gesoff wrote that IBM employees haven't "been showing any visible effort to familiarize themselves with our processes" to determine when to relocate the

An IBM spokesman deferred all comments to the county. General Services Commissioner Susan Egginton said the county is "continuing to discuss" the computer relocation date with Gesoff. "We're still committed to [starting the relocation on] April 30," Egginton said.

WCC's problems are fueling opponents' efforts to get the courts to rescind the outsourcing deal.

IBM "didn't do good due diligence" by familiarizing itself with the county's business requirements before taking over IS operations in January, said Luigi Martino, a 23-year systems analyst for the county and one of 92 Civil Service Employee Association members suing the county to get their jobs back.

Martino said Systems and Computer Technology Corp., a Malvern, Pa.-based vendor that was a finalist for the outsourcing deal, "brought in an army of people and asked lots of ques tions about our operations. IBM didn't, and it's showing now."

"It's illegal. This is outrageous. I'm furious over this,' said Tom Abinanti, a county board member who opposes the deal. Abinanti said the outsourcing contract "was not a good deal for taxpayers" because the county "is not getting the performance we're paying for."

DEMAND-CHAIN MANAGEMENT

Tools help forge link between suppliers, users

By Randy Weston

INDUSTRI-MATEMATIK International Corp. (IMI) is modernizing its demand-chain management software package to make it easier to customize and integrate with other enterprisewide

The Tarrytown, N.Y.-based software maker last week debuted Version 5 of its System ESS demand-chain planning software. The software manages customer orders, service, distribution, customer inventory replenishment, pricing and promotions

The addition of an objectoriented architecture to IMI's current offering is important because it will let users more easily customize the system.

It also has a new gateway that includes application programming interfaces (API) and object request brokers that meet Open Application Group stan-

The standard APIs and object request brokers let users easily bolt System ESS to enterprise systems such as Oracle Corp. applications or SAP AG's R/3. as well as niche systems such as Manugistics, Inc.'s supply-chain

IMI is one of a handful of software vendors carving a niche in the demand-chain planning market. Among the 150 users of its software are Black & Decker Corp., British Airways in Hounslow, England, and Campbell Soup Co.

LISTENING TO USERS

IMI and other software vendors are now meeting users' demands for integrated software packages that tie the entire enterprise together - from managing suppliers to customers, according to Dennis Byron, an analyst at International Data Corp. in Framingham, Mass.

Skyway Freight Systems, Inc., a transportation service in Watsonville, Calif., plans to use IMI's order management software as part of a larger system to manage its customers' supply

'Our customers are demanding it," said Cris Imai, marketing manager at Skyway.

The general release of System ESS Version 5 is slated for May 24. Pricing starts at \$600,000 and varies depending on customer configuration needs and transaction load.

Help desk software target

▶ Distributed server can cut call volume

By Kim Girard

WITH AN EYE on the slow but growing migration to Windows NT, Remedy Corp. is positioning its help desk line so companies can tackle NT support problems at many locations.

Driving Remedy's interest is the likelihood that within two to three years, three quarters of Remedy's new sales will be made to NT users, said Jack Gold, an analyst at Meta Group, Inc. in Stamford, Conn. Larger corporations are expected to use Unix alongside NT, and Remedy will be committed to both, he

With that in mind, Mountain View, Calif.-based Remedy last week unveiled a help desk product line for Windows NT. The products include a distributed server that can handle multiple applications at different locations and a gateway called AR-Web that works with the server to turn a user's World Wide Web browser into a client. With a gateway, users can tap in to the help desk system using the Web. Remedy is also tying Microsoft Corp.'s Exchange to the help desk with a mail server.

The distributed server replicates information from a central server across geographically dispersed help desks and can route calls according to time of day and the expertise level of employees at a particular location.

A distributed server can curb call volume by 10% to 15%, according to Keith Bigelow, product manager at Remedy. The servers let companies pull together information from multiple servers and more quickly respond to changes, said Hugh Bishop, an analyst at Aberdeen Group, Inc. in Boston.

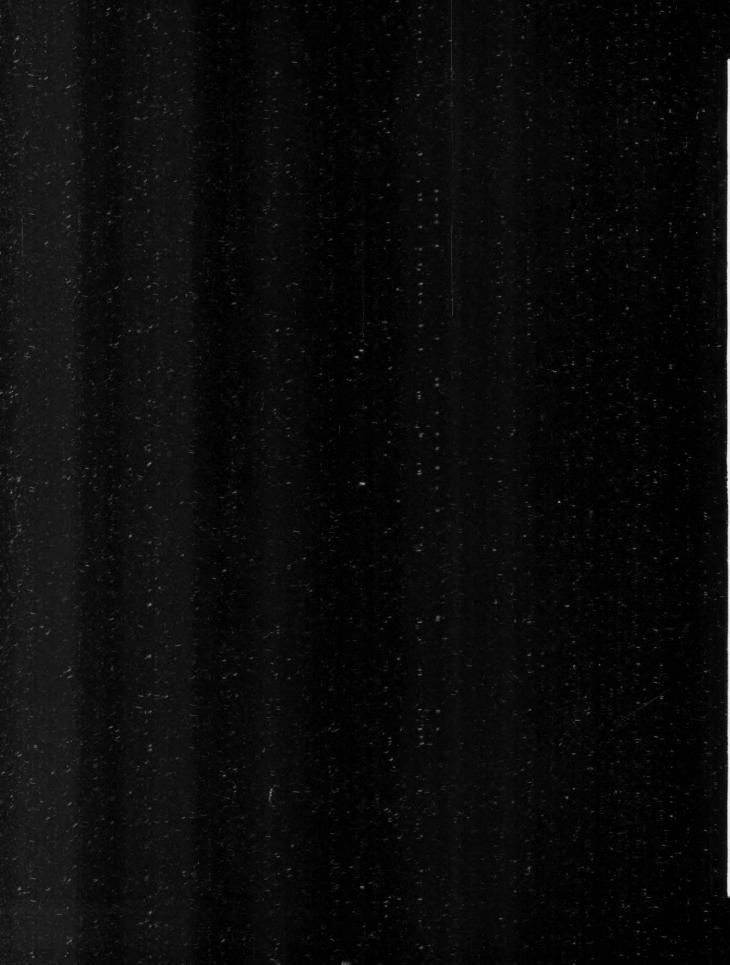
Remedy's NT distributed

\$15,000 minus the cost of perseat licenses - is a less-expensive alternative to high-end solutions offered by Clarify, Inc. in San Jose, Calif., Vantive Corp. in Santa Clara, Calif., and Scopus Technology Corp in Emeryville. Calif., Gold said. Those can cost up to \$500,000, he said.

The National Institutes of Health (NIH) in Bethesda, Md., is testing Remedy's ARWeb to link its users to the NIH's Remedy help desk system. NIH moved from Unix to NT this month and has 18,000 users who previously were limited to calling or using electronic mail help desk assistance. Now, they can also use their

Remedy products for Windows NT-based help desks

Product	Available	Price
Distributed server option	Now	\$15,000
ARWeb for Windows NT	Second quarter	\$12,000
Remedy Mail Server for Microsoft Exchange	Now	No charge



Snafus plague IBM/county deal

▶ Outage exploited in legal battle over outsourcing contract

By Thomas Hoffman

THREE DAYS of computer downtime at a local community college is just the kind of ammunition that opponents of a 3-month-old, \$102 million outsourcing contract plan to use in their legal battles to stop the politically thorny deal.

In January. County Executive Andrew O'Rourke hired IBM to take over the bulk of information systems operations in New York's Westchester County under a 10-year contract [CW, Jan. 27]. That same month, a New York State Supreme Court judge ruled that the contract was illegal, because only the county's board of legislators had the authority to allocate funds for the contract.

The county has since been granted a stay by the courts to allow IBM to continue running its IS operations until a decision on the appeal has been reached.

The latest salvo in the ongoing battle is a memo sent by



Mark Gesoff, director of information systems at Westchester Community College (WCC) in Valhalla, N.Y., complaining that WCC is "experiencing enormous frustration" with the county's outsourced services.

Those frustrations include WCC's three-day outage in late March, which was caused in part by IBM's inability to communicate domain name server changes to the college when those changes were made.

Following the computer disruptions. WCC plans to deduct \$25,000 per day "or part thereof" from its services billings. wrote Gesoff, who couldn't be reached for comment.

Gesoff also wrote that he is upset with IBM's plans to move data center equipment in early May when summer registration and processing of grades for the spring semester begin. Gesoff wrote that IBM employees haven't "been showing any visible effort to familiarize themselves with our processes" to determine when to relocate the equipment.

An IBM spokesman deferred all comments to the county. General Services Commissioner Susan Egginton said the county is "continuing to discuss" the computer relocation date with Gesoff. "We're still committed to [starting the relocation on] April 30." Egginton said.

WCC's problems are fueling opponents' efforts to get the courts to rescind the outsourcing deal.

IBM "didn't do good due diligence" by familiarizing itself with the county's business requirements before taking over IS operations in January, said Luigi Martino. a 23-year systems analyst for the county and one of 92 Civil Service Employee Association members suing the county to get their jobs back.

Martino said Systems and Computer Technology Corp., a Malvern, Pa.-based vendor that was a finalist for the outsourcing deal, "brought in an army of people and asked lots of questions about our operations. IBM didn't, and it's showing now."

"It's illegal. This is outrageous. I'm furious over this." said Tom Abinanti. a county board member who opposes the deal. Abinanti said the outsourcing contract "was not a good deal for taxpayers" because the county "is not getting the performance we're paying for." "

DEMAND-CHAIN MANAGEMENT

Tools help forge link between suppliers, users

By Randy Weston

INDUSTRI-MATEMATIK International Corp. (IMI) is modernizing its demand-chain management software package to make it easier to customize and integrate with other enterprisewide

The Tarrytown, N.Y.-based software maker last week debuted Version 5 of its System ESS demand-chain planning software. The software manages customer orders, service, distribution, customer inventory replenishment, pricing and promotions.

The addition of an objectoriented architecture to IMI's current offering is important because it will let users more easily customize the system.

It also has a new gateway that includes application programming interfaces (API) and object request brokers that meet Open Application Group standards.

The standard APIs and object request brokers let users easily bolt System ESS to enterprise systems such as Oracle Corp. applications or SAP AG's R/3, as well as niche systems such as Manugistics, Inc.'s supply-chain

management software.

IMI is one of a handful of software vendors carving a niche in the demand-chain planning market. Among the 150 users of its software are Black & Decker Corp., British Airways in Hounslow, England. and Campbell Soup Co.

LISTENING TO USERS

IMI and other software vendors are now meeting users' demands for integrated software packages that tie the entire enterprise together — from managing suppliers to customers, according to Dennis Byron, an analyst at International Data Corp. in Framingham, Mass.

Skyway Freight Systems, Inc., a transportation service in Watsonville. Calif., plans to use IMI's order management software as part of a larger system to manage its customers' supply

"Our customers are demanding it," said Cris Imai, marketing manager at Skyway.

The general release of System ESS Version 5 is slated for May 24. Pricing starts at \$600,000 and varies depending on customer configuration needs and transaction load.

Help desk software targets Win NT

▶ Distributed server can cut call volume

By Kim Girard

WITH AN EYE on the slow but growing migration to Windows NT, Remedy Corp. is positioning its help desk line so companies can tackle NT support problems at many locations.

Driving Remedy's interest is the likelihood that within two to three years, three quarters of Remedy's new sales will be made to NT users, said Jack Gold, an analyst at Meta Group, Inc. in Stamford, Conn. Larger corporations are expected to use Unix alongside NT, and Remedy will be committed to both, he said.

With that in mind, Mountain View, Calif.-based Remedy last week unveiled a help desk product line for Windows NT. The products include a distributed server that can handle multiple applications at different locations and a gateway called AR. Web that works with the server to turn a user's World Wide Web browser into a client. With a gateway, users can tap in to the

help desk system using the Web. Remedy is also tying Microsoft Corp.'s Exchange to the help desk with a mail server.

The distributed server replicates information from a central server across geographically dispersed help desks and can route calls according to time of day and the expertise level of employees at a particular location.

A distributed server can curb call volume by 10% to 15%, according to Keith Bigelow, product manager at Remedy. The servers let companies pull together information from multiple servers and more quickly respond to changes, said Hugh Bishop, an analyst at Aberdeen Group, Inc. in Boston.

Remedy's NT distributed

server option — which costs \$15,000 minus the cost of perseat licenses — is a less-expensive alternative to high-end solutions offered by Clarify, Inc. in San Jose, Calif., Vantive Corp. in Santa Clara, Calif., and Scopus Technology Corp in Emeryville, Calif., Gold said. Those can cost up to \$500,000, he said.

The National Institutes of Health (NIH) in Bethesda. Md.. is testing Remedy's ARWeb to link its users to the NIH's Remedy help desk system. NIH moved from Unix to NT this month and has 18,000 users who previously were limited to calling or using electronic mail for help desk assistance. Now, they can also use their

Remedy products for Windows NT-based help desks

Product	Available	Price
Distributed server option	Now	\$15,000
ARWeb for Windows NT	Second quarter	\$12,000
Remedy Mail Server for Microsoft Exchange	Now	No charge

Open 24 hours.





Unfortunately, it is not always what you can expect. That's why more and more organizations, both large and

small, are choosing scalable, dependable Standard High Volume (SHV) servers based on Intel architecture processors like the Pentium® Pro processor.

SHV servers span entry-level through mid-range applications, including a broad base of commercial, off-the-shelf software based on Windows NT* and UnixWare*. These systems give you the performance headroom you need today, and the ability to scale that performance as your business needs grow. And they're available from many quality systems suppliers.

What's more, SHV servers running some of the most popular management software help keep your information system up and running, while keeping your total cost of ownership exactly where it belongs—down. To learn more about SHV servers, visit Intel's Web site at www.intel.com/SHV/servers



The Computer Inside.™

Computer Industry

FIRST-QUARTER* FINANCIALS

OI 1996 \$4.218 \$234M DI 1997 \$4.818

Percent change Revenue: 14% Profit: 65%

Compaq credited asset management with reducing inventory and boosting profit.

Digital Equipment Corp.



Percent change
Revenue: -9% Profit: -58%

Reversue was below company expectations. Bright spots: Windows NT and Internet products and services.

Intel Corp.



Percent change
Revenue: 39% Profit: 124%

MMX chip sales and 64% margins drove earnings.

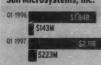
Sprint Corp.



Percent change
Revenue: 7% Profit: -6%

Increased spending on wireless and international service was blamed for the drop in profit.

Sun Microsystems, Inc.



Percent change
Revenue: 15% Profit: 56%

Java gets all the hype, but it contributed little in revenue. Sales of highend servers are what kept Sun hot.

4 that eats outcodes ourselve

3Com unveils reorganization

▶ U.S. Robotics deal prompts split into three units

By Bob Wallace

3COM CORP. last week announced a major reorganization in anticipation of its summer merger with U.S. Robotics Corp. It also said a key executive is leaving.

Robert Finocchio, president of 3Com's switching unit, said he will step down after May 31 for personal reasons.

Last August, 3Com split into two units: 3Com Systems, which handles switches, hubs and routers; and 3Com Interface Products, which makes adapter cards and other products.

Under the latest reorganization, which will take effect when the merger goes through, 3Com will have three divisions: enterprise systems for hubs, switch-



The company's switching unit president will step down

es, routers and network management; carrier systems for carrier and service provider equipment; and client access for IAN and WAN access devices.

One analyst said Finocchio's departure will be felt. "This is a big loss for 3Com, as Bob has

done a phenomenal job for the company, especially in integrating the many companies 3Com has acquired over the last several years. He'll be very difficult to replace," said Nick Lippis, president of Strategic Network Consulting, Inc. in Rockland, Mass. Finocchio joined 3Com in 1988.

But Finocchio's departure is just one challenge facing the Santa Clara, Calif., vendor, whose financial performance has disappointed analysts.

FINANCES IN DOWNSWING

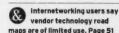
"Although it seems everyone but Cisco [Systems, Inc.] and Ascend [Communications, Inc.] has been ravaged, 3Com's stock has plummeted from about \$78 a share on Dec. 10 to almost \$32" last Tuesday, said Paul Weinstein, an analyst at Paine-Webber, Inc. in San Francisco. "They completely missed their

last quarter," he said.

3Com has tried to boost its switch sales by slashing prices on its low-end Ethernet switches, a move that Cisco recently followed and will likely be copied by other rivals, Weinstein said

And 3Com has lost its lead in data-center switching to Cisco. That's partly because Cisco delivered switching add-ons faster than 3Com, said Eric Hindin, an analyst at The Yankee Group, a Boston consulting and research firm.

3Com hopes that near-term plans for Gigabit Ethernet addons, new switches and enhancements will boost its market share in the data-center switch market. □



· Revenue declines

Apple misses mark; reports \$708M loss

By Lisa Picarille

APPLE COMPUTER, INC. posted a whopping \$708 million loss for its second fiscal quarter ended March 28, taking large write-offs for its acquisition of Next Software, Inc. and a massive restructuring that slashed 4.000 jobs.

Setting those two items aside, Apple still would have lost \$186 million.

But the dramatic \$708 million loss isn't the firm's largest—that came in the second fiscal quarter last year, when Apple recorded a \$740 million loss.

Since Amelio took over as Apple's chairman and CEO, the company has posted losses totaling more than \$1.6 billion.

Some of those charges also were associated with a companywide reorganization.

Despite some strong product introductions, including new PowerBook notebooks, Apple's sales were only \$1.6 billion, compared with \$2.2 billion for the same quarter last year.

Apple, in Cupertino, Calif., sold just 602,000 units in its second fiscal quarter, compared with 892,000 units in the second quarter last year.

"Apple either has to stop or reverse the decline in unit sales or face a takeover," said Charles Wolf, an analyst at Credit Suisse First Boston Corp., a securities firm in New York.

SOME SUCCESSES

There were a couple of bright notes for Apple. Sales of Power-

Books accounted for 22% of the company's total sales for the quarter, compared with 10% for the prior quarter.

And Claris Corp., Apple's software development arm, had its most successful

quarter ever, posting record revenue of \$70 million.

But Apple ended the quarter with a \$420 million backlog mostly high-end Power Macintosh desktop systems. predicted that the company would be profitable by the end of last year.

Oracle Corp.'s outspoken chairman and CEO, Larry Elli-

son, has publicly stated that he is forming group of investors - not associated with Oracle to mount a bid to take over Apple. Responding to the idea of Ellison, or anyone, taking over Apple, Amelio said. "I feel that regardless of who is head of

the company, we are doing what must be done to move the company forward."

Ellison's plan would include turning Apple into a manufacturer of network computers.

"We have an idea. We want to have a product users want to buy," Amelio said. "There will be a place for NCs. But candidly, at this point there is not a market for NCs of any substance. Not a single customer has walked in and pounded his fist on my desk and asked for an NCC."

	Revenue	Profit/Los
Q1 1996	\$3.1B	-\$69M
Q2 1996	\$2.2B	-\$740M
Q3 1996	\$2.2B	-\$32M
Q4 1996	\$2.3B	\$25M
Total	\$9.88	-\$816M
Q1 1997	\$2.1B	-\$120M
Q2 1997	\$1.6B	-\$708M
Total	\$3.7B	-\$828M

"The last 12 months have been stormy, to say the least," said Apple chairman and CEO Gilbert Amelio in addressing press and financial analysts last week. "The worst is behind us. I want to make one thing clear: We won't be satisfied until the company is returned to profit-

Apple's chief financial officer, Fred Anderson, said the company is still working to return to sustained profitability by the end of its fiscal year in September. Apple officials originally APRIL 21, 1997 VOLUME 3, ISSUE 4

COMPUTERWORLD

Leadership Series

3 Truths for IS

BY THORNTON MAY

THERE IS NO such thing as

non-electronic commerce. Every product built, bought and invoiced involves electronic commerce (the exchange of value between parties via electronic means). The big news is not that business is being conducted electronically. Duh!!! The big news is that failure to do so creatively, quickly, reliably and cost-effectively now puts the enterprise at risk. If you're a senior IS decision maker who wants to be in on the reward, instead of regarded as a risk factor, there are three immutable truths about "EC" you need to know.

TRUTH 1 IS' Role is to Make Electronic Commerce Happen



THE CXOS - chief executive, operating and information officers - are spending time telling financial analysts why their orga-

nizations are in front of the electronic commerce pack. Yet, they still haven't convinced their own employees or IS managers (see chart page 3).

Some organizations have legitimate bragging rights: The Vanguard Group (www.vanguard.com), AT&T (www.att. com), Cisco Systems, Inc. (www.cisco.com), Charles Schwab & Co. (www.schwab. com), Hollywood Stock Exchange (an online game found at www.hsx.com), Security First Network Bank (www.sfnb.com), Nationwide

Insurance (www.nationwide. com) and USA Today On-Line (www.usatoday.com).

But in reality, most organizations are milling around, waiting for a visionary in their market to break away from the pack.

A role exists for someone to create and transform executivelevel visions into moneymaking electronic commerce first steps. That someone is you.

Information systems executives have to stake out their position in this game of musical chairs before the music stops.

There are plenty of contenders for this role: internal constituencies/rivals (marketing, marketing communications, rogue pockets of IT reporting to business units, skunk works) and external suppliers/rivals (advertising agencies, boutique design houses, consultants and vendors). But with electronic commerce, IS can run the business. Here, IS is the business. IS can make money for the organization. You're in the sweet

Many CIOs recognize this. Between November 1996 and March 1997, researchers at Cambridge Technology Partners' Management Lab polled 374 information technology decision makers about the role they are playing in EC. We borrowed a four-part framework from Gerry Faust, who helps executives identify and take on high-value roles inside their companies at the UCLA John E. Anderson Graduate School of Management's "Managing the Information Resource" program. We asked CIOs which of these roles best described their own EC role. The results:

■ 35% - ENTREPRENEUR: What the organization needs to do in the future to be effective. This role requires creativity and a willingness to take risks.

■ 35% - PRODUCE RESULTS: What the organization needs to do to be successful. This role requires knowing what needs to be done, how to do it and the drive to see that it gets done.

■ 22% - ADMINISTER SYSTEMS: How to do things to ensure the organization is efficient. This requires attention to detail, a willingness to take corrective action and knowledge of the approved way of doing things. ■ 8% - INTEGRATE: Creating a climate conducive to teamwork and cooperation. Sensitivity to

OUT OF TOUCH

Executives, think your EC strategy is ahead of the curve? Guess what! Your employees don't think so .

Which strategy best describes your organization's approach to electronic commerce?

SENIOR EXECUTIVES	EMPLOYEES
43%	11%
41%	4%
8%	59%
8%	22%
	43% 41% 8%

... and neither do IS managers.

How would you grade your company's

	GRAPE	SCORING
Clarity of goals	C (2.14)	A: 4 points Excellent
Linderstanding of competitive environment	C (2.10)	B: 3 points
Understanding of in-flouse resources	C+ (2.57)	C: 2 points
Understanding of implementation realities	C (2.33)	D: 1 point

people, moods, climates and group processes are needed to play this role.

More than two-thirds of CIOs feel it's their job to make EC happen, either as entrepreneurial leaders or as go get 'em, make it happen types. That's a leading role, all right.

What does, and does not, a "leading role" involve?

IS should not try to unilaterally lead and control EC initiatives. That would only hamstring them. If you try to be a czar, you'll wind up like the





Instead of merely managing chaos, why not capitalize on it? For some, change is a threat, something that must be managed or great harm will ensue. Nonsense. For the stout of heart, change is an opportunity. As the world's premier provider of scalable, manageable and secure Internet solutions, along with leading Internet consulting services, we can extend your enterprise to the world and propel your business forward. Don't get battered by change. Harness it at www.hp.com/go/computing Capitalize on chaos.

COMPUTERWORLD Leadership Series

Romanovs. Instead, IS leaders should aim to be part of a team.

New age organizations like Dreamworks SKG and Patagonia structure their EC initiatives like a "pick up" basketball game, creating an internal buzz around a semi-official, semi-unfunded, off-balance sheet skunk work development program.

Traditional enterprises like Bank of Boston evaluate EC projects using already existing IT budgeting procedures, and staff these projects with people from many departments using routine project staffing procedures. The common theme: no muss, no fuss, no political "who-owns-the-future" fights.

■ IS must be seen as an EC thought leader. Organizations generating the highest payback from their EC investments see IS as playing a significant thought leadership role. This doesn't mean IS must think up, sell and execute the idea. Rather, IS needs to stay connected to the leading-edge thinking and thinkers in EC.

For example, IS management at Vanguard and Nation-wide have established "open" EC learning environments. They reach out to thought leaders and practitioners operating outside the company, exposing a critical mass of executives to new thinking and what others have done. From these thinkins, new projects emerge; executives are given the time to adopt what they've learned to their own needs and experiment.

■ While IS must share responsibility for EC with many groups, responsibility must also remain inside the company. Organizations short on time and resources (and who isn't?) frequently turn to consultants and outsourcers for assistance or push the whole thing onto one department's plate.

This is not a bad thing if it's not done to excess and internal management retains control and stays involved. But too many executives delegate the "vision" portion (the initial value targeting exercise) of the electronic

campaign to consultants, advertising agencies or one internal department like IS or marketing. This is a huge mistake.

■ Budget responsibility should be shared between IS and non-IS management. Long-term success in EC requires a crossfunctional sense of connectedness and shared purpose and vision. Getting people to pony up the dough at the inception of the project establishes a precedent for collaboration down the road when tougher decisions and bigger investments will be made.

In summary, EC is not something you do for someone, but something you do with someone. IS must create, then participate in, a channel where employees' energies can make EC projects happen. To fulfill its role—turning vision into action

— IS must communicate rather than manipulate; create dialogue, not hold monologues. Above all, IS must foster an informed, accurate and honest exchange of information. That's the ultimate information service.

TRUTH IS Must Create New Skill Sets



IS EXECUTIVES still lack knowledge and experience with the new keystone technology of electronic commerce: the Internet.

In 1984, only 27% of IS managers in a survey conducted by consultancy Nolan, Norton & Co. had had experience designing, building and managing PC applications.

A decade and change later, we conducted a similar survey about the Internet/intranet/extranet. We asked IS managers if they had experience with designing, building and managing Webcentric applications. Unbelievably the answer, once again, was 27%.

IS executives admit they and their organizations aren't spend-

EIGHT JOBS FOR THE EC ERA

Creating an EC team? Here are the positions you may need to create and fill, according to Stephen Coles, Chief Scientist, Emerging Technologies at Computer Sciences Corp., and Bret Sommers, a systems architect at Cambridge Technology Partners.

- 1. Systems Architect Must know existing standards, internet tools and have extensi ice with mainframe and client/server systems. SALARY: \$70K-\$100K
- 2. Network Infrastructure Support Experience with installing and ning TCP/IP networks; know es NT 4.0, Unix, firewall nistration, Internet security and web application scaling issu SALARY: \$50%-\$80K
- 3. Project Manager Knews Internet technology; can ne diverse skill sets and delle extremely rapid prototypes. ows Microsoft Office and

Microsoft Project. SALARY: \$70%-\$90K

- 4. Web Site Developer Knows softwars developme practices and standard develop ment tool sets such as SmallTelk, PowerBuilder 5.0, Java, HTML 3.2 and Perl. Can work with im-SALARY: \$35K-\$45K
- 5. Content Author/Publisher

Experienced technical writer who knows HTML conventi hypertext authoring tools and journalistic style and editing. Experience applying publishly SALARY: S30K-S60K

6. Resident Artist/ Photographer/Post Production Editor Understands desktop publishing tools; can create professional quality multimedia graphics using modern image-editing SALARY: \$30K-\$50K

- 7. Webmaster Keeps the web site up and runn captures and distributes usage data and coordinates roll out of new applications or "presences" on the Internet and intranets.
- 8. Technical Support/Help Desk Provides remote telephone in lass than 24 ho SALARY: \$30K-\$45K

SALARY: \$40K-\$60K

Full descriptions of these positions can be found online at www.computerworld.com/ leadership.

ing enough time or money getting smart about these technologies. As the chart on page 11 demonstrates, they give themselves low grades for understanding electronic commerce's implementation realities, resources and competitive environment.

The rise of net-based electronic commerce is creating new IS roles (see story this page). Skills that are rising to the fore in IS - project management, facilitation, contract management — are important here, too. EC will also require IS organizations to cultivate these new

■ PRESENTATION MANAGEMENT: IS

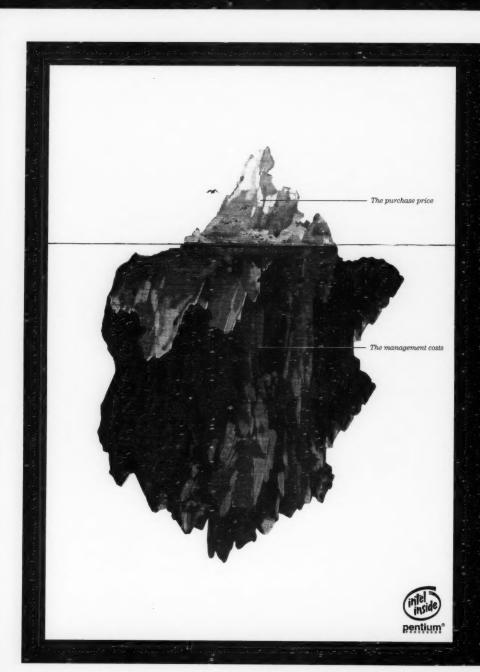
requires people who can create order in an information-overloaded world. This is the new breed of information manager Richard Saul Wurman prophetizes in his new book, Information Architects: "The individual who organizes the patterns inherent in data, making the complex clear ... a person who creates the structure or map of information which allows others to find their personal paths to knowledge.

■ CONTENT MANAGEMENT: Logic, not content, has been the focus of application development. Artists, designers, writers and records managers held the undervalued franchise for content management.

Today, content is king. These people, or at least their skill sets, now must be incorporated into the EC application development

RECORD MANAGEMENT: Most organizations haven't codified policies for managing electronic records or invested time or money on this. How long should you keep electronic-mail records? Faxes? What records do we have to produce in support of litigation-based discovery pro-

Enter Web pages which update dynamically and you begin to get a feel for this emerging issue.



When choosing a PC for your company, remember the lesson of the Titanic. High PC management



HP Vectra PCs

costs aren't just bad in themselves; they
also translate into lost productivity. Worse,
they suggest a PC environment barely
under control. But at HP, we don't just

make Intel® Pentium® processor-based PCs that you can manage. We make PCs that help you manage. Between our hardware and software features such as TopTOOLS and OpenView, we offer a host of non-proprietary, DMI-standards-based management solutions. You can upgrade remotely, monitor every PC in your network, troubleshoot problems and, in general, minimize costs. The iceberg will still be out there, of course. But it won't be one you'll founder on. www.hp.com/go/vectracommercial

Better products, better productivity.



IS Leaders Must Relentlessly Search for EC Value



FEW COMPANIES know how to calculate IT value, let alone consistently deliver it. These systemic weaknesses plague the whole EC scene, where neither a dominant cost model nor even a consistent vocabulary for discussing costs has emerged. (However, IS managers can roughly estimate the size and controllability of costs - see chart next page).

The value issue is a real whammy for IS executives. Credibility is the lifeblood of IS in particular and leadership in general. If your new system isn't worth developing, your credibility is shot even if you deliver systems on time and on budget. To be an EC leader, IS executives must do more than be thought leaders, enablers and coaches. They must be value pigs, rooting for benefit truffles.

We went looking for value in two places. One, we examined actual EC applications and the value they delivered. Two, we found out what sells top executives on EC, by analyzing the business cases used in 42 companies to win funding for EC projects. (Reducing costs, improving the image of the organization, retaining customers and increasing revenues were the top four hard dollar benefits promised.)

We discovered that whatever your industry, using web technology to service existing customers is the most valuable EC application today in terms of payback, time-to-deployment and risk. This is because the work processes being modified are understood, and Internets, intranets and extranets are natural customer support vehicles.

Self-service accounts for a big part of the payback. Federal Express had the very clever idea of charging customers to track their own packages, i.e., the cost of entering data has shifted from Fedex to the customer. Who knows, an expanded service might let us drive the trucks as well. Charles Schwab's web site points toward the future of finance; it enables customers to do financial planning and download prospectuses and order forms.

Cisco Systems' CIO, Peter Solvik, speaking at the fall Lyceum (a quarterly meeting of CIOs organized by my firm), explained, "The majority of our interactions with our customers now occurs over the Internet. The Internet is doing 70% of the work, the remaining 30% takes up to 1,000 people." Figure out the math. Electronic commerce applications linked with knowledge management work processes have enormous payback.

EC can also deliver value by improving employee productiv-

ity, at least where information handling is concerned. Research conducted by the Emerging Technologies Advisory Group at the Association of Information and Image Management (AIIM) posits that U.S. knowledge workers spend approximately 20% of their workweek simply processing information. Intranets are a huge opportunity area.

Channel management applications (transaction processing over the Internet) offer a high payback but with much higher risk. They require you to modify processes and behaviors of consumers and suppliers over whom you have limited control. Have you ever fired a customer?

These systems are also the most complex electronic applications now deployed. They span the value chain from product marketing through transaction processing to post-sales customer support. The cyber-cash register (the ability to safely exchange money) and the cyber-shipping dock (the ability to make sure customers receive what they bought) remain stumbling blocks. Cyber-security has to be part of any channel management program. Fulfillment modules have to link with legacy databases. This integration is not easy and is not cheap. For every dollar spent on new EC code, four additional dollars will be spent linking back to legacy systems.

On the cost side, the real problem for organizations is stepping up to pay for the infrastructure needed to make EC happen.

Jim Best, ex-IS vice president at Allied Signal and author of The Digital Organization (1997, John Wiley & Sons, New York) asked research participants at the Scottsdale Center for Business Technology, "Has Internet technology caused you to change your infrastructure requirements or plans?" Thirteen percent said "some." Sixteen percent said they were "still evaluating the question." Thirty-nine percent said "yes;" and an amazing 32% said "no." This led a surprised Best to conclude that most executive teams perceive the Internet to be "fast, free, universal and easy."

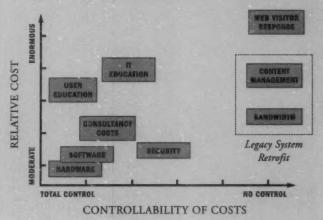
Boy, are they wrong. Best's research suggests that sizable global organizations (40,000+ PCs) need to spend \$18 per desktop per month to keep the bridges, routers and hubs portion of the infrastructure world class. Almost no organization spends at that level today. Organizations where infrastructure is an issue but not an impediment spend \$11 per desktop per month. Organizations coming perilously close to 'red lining' their infrastructures only allocate \$8 or less.

Best's book lays out a six-step process which organizations can use to "catch up" and "keep up" when it comes to infrastructure:

1. Centralize management responsibility for infrastructure and standards. 2. Define architecture and establish standards. 3. Perform a "gap analysis." (Assess

WHAT'S THE COST?

While the art of costing EC initiatives remains murky, IS managers already have a sense of the relative price of each cost factor, and how controllable these costs are



urce: 1997 Cambridge Technology Partners study of 42 Heads of Applications Development/Webma

how far from the defined architectural standard is each site. Label sites as either compliant, significant upgrade required or total rebuild necessary.) 4. Secure infrastructure funding. 5. Execute an upgrade program. 6. Anticipate future needs.

Making the business case for infrastructure is the toughest challenge facing CIOs. It requires technical competence, communications skills and political savvy to convince senior management.

To conclude, focusing on the three immutable truths will help IS executives avoid trouble in the electronic commerce arena. People need to know that IS' role is to turn EC hopes into EC realities. IS management needs to demonstrate thought leadership and create credibility by upgrading and deploying EC skill sets in pursuit of high-payback, short-duration, risk-appropriate EC investments. Good luck and happy truffle hunting.



ABOUT THE AUTHOR:

Thornton A. May is the Vice President of Research and Education at Cambridge Technology Partners, Inc. in Cambridge, Mass., an international professional services organization specializing in rapid development of high-impact business systems. He is an adjunct executive education faculty member at the John E. Anderson Graduate School of Management at UCLA, and chairs the Association of Information and Image Management. His E-mail address is tmay@ctp.com.

COMPUTERWORLD LEADERSHIP SERIES: Edisor: Allan E. Alter; Managing Edisor: Catherine McCrorey; Designer: Stephanie Faucher. For article submissions and information, call Allan Alter at (508) 620-7714, or E-mail him at allan_alter@cw.com. For presious Leadership Series articles, call (508) 820-8125.





The new HP NetServer E 40

Easy installation
Reliability: Standard ECC memory and Automatic Server Restart
NOS certified (Netware, SCO, Windows® NT)
Easy manageability through HP Support Anywhere
Intel® Pentium® Pro processors—180 and 200 MHz

FROM \$2,159*

Hey, if this isn't a PC, why is it priced like one?

Easy to afford and now easy to find at: www.hpresource.com/e_series-8

PACKARD

Despite an early lead in technology, will America end up playing second fiddle?



America's IT industry. The best in the world. But we're throwing away our leadership. Because our knowledge and skills aren't being passed on to enough of our young people. Tech Corps gives your corporation a vehicle to change that. By supporting a grassroots

(1) JT (1) JT effort to enhance teaching and learning through technology. And give students the skills they need to keep our country number one. Discover the rewards of becoming a Tech Corps Corporate Sponsor. 508/620-7751 • http://www.ustc.org America needs to know.

Organizations already providing national sponsorship include: Cellular Telecommunications Industry Association Foundation (CTIA), Digital Equipment Corporation, and MCI Foundation. Talking in the halls.

Incessant phone calls.

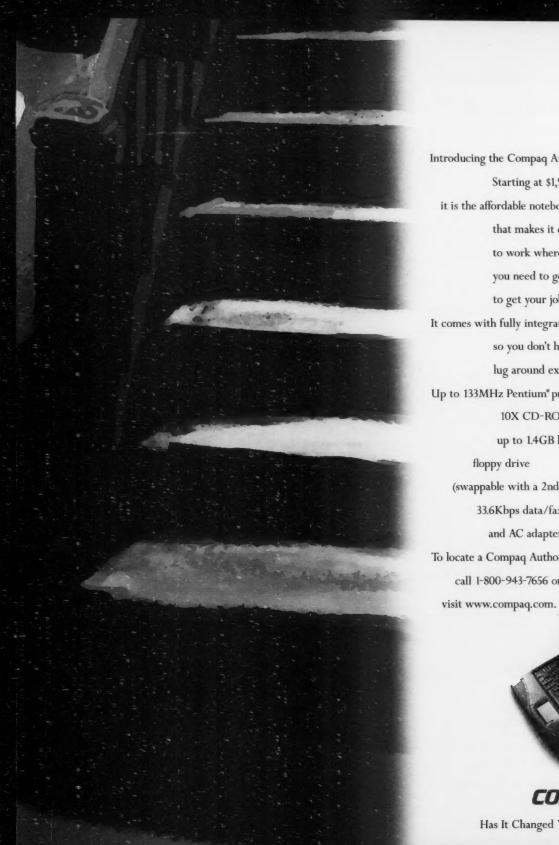
Co-workers swinging by.

Other people's "private" conversations.

The only thing wrong
with your cubicle is that you're
expected
to work
there.



Problems/scored as offered states presed entry even model. Residen prices may vary, 61997 Connean Computer Compretion. All rights, televied, but an analysis of the problems of the prices may be a because of the prices of the p



Introducing the Compaq Armada 1500. Starting at \$1,999;* it is the affordable notebook that makes it easy for you to work wherever you need to go to get your job done. It comes with fully integrated features, so you don't have to lug around extra parts. Up to 133MHz Pentium® processor, 10X CD-ROM, up to 1.4GB hard drive, floppy drive (swappable with a 2nd battery), 33.6Kbps data/fax modem and AC adapter, all built in. To locate a Compaq Authorized Reseller, call 1-800-943-7656 or

Has It Changed Your Life Yet?

INION

Fear and loathing on the 'net The Heaven's Gate tragedy came first,

then the Social Security Administration's Web site.

They're the most recent examples of witch-hunts based on mistaken ideas of what the Internet is and isn't.

OK, let's take a collective deep breath and review. The Heaven's Gate mass suicide had absolutely nothing to do with the fact that many of the people involved were programmers, or that the cult maintained a Web site. How many people do you know call their bodies "vehicles" and believe that a spaceship will collect them to bring them to the next "level"? And what has any of this got to do with computers, anyway?



Still, some broadcasters depicted this as the "devil on the Internet." Some shows even ran stories about how to keep kids out of 'net-based cults. They missed the point entirely. This wasn't a computer-related story; it was about

the unfortunate choices this group of people made.

This month, a USA Today story and other reports in the popular press sparked a fury about the Social Security Web site, which was then closed down until further notice. But it's worth noting that no one knows of any actual privacy breaches caused by the site — the furor was about the potential for sensitive information to get into the wrong hands.

To access the site, you had to enter your Social Security number, place of birth and mother's maiden name, among other data. Not too many people know all of that information about me. How about you?

As a colleague pointed out, anyone can request a change of address at the Post Office for anyone else without showing any identification. But once you put a service like that on the 'net, it suddenly becomes evil, and mass hysteria breaks out.

It's good that questions are being raised and that people are concerned. They should be; security and other issues regarding the 'net are far from settled. But it's up to all of us in the computer industry to help educate the public about how to be smart consumers on the 'net — and where the real threats lurk.

Johanna Ambrosio, online editor



The SPA is more than the software industry's antipirate . . .

It's a bright

new day for

the SPA.

LET ME COMMENT ON several points made in a recent column by Maryfran Johnson ["Sunset time," CW, March 31].

For more than 12 years, the Software Publishers Association (SPA) — with the energetic leadership of

Ken Wasch, with the assistance of a very professional staff and under the direction of a 15-person board of industry executives—has been a leading and

vigorous voice for the software industry. In focusing exclusively on the SPA's efforts to reduce software piracy at home and abroad, the column neglects to highlight the wider range of activities in which the SPA is engaged.

Last year, the SPA spent about \$3 million fighting software piracy. The other \$6 million of the budget was dedicated to working on other issues of concern to our members. It would be negligent for the industry's principal trade association to ignore piracy, which continues to be a significant problem.

For that reason, the board has approved additional investment in antipiracy activities, particularly in the Asian Pacific and Latin America, where the problem is growing. The SPA is running within its budget this year. As a not-for-profit organization, our board authorizes an annual budget aimed at achieving specific objectives — we do not "make profit" or "lose money."

The SPA mission is to protect and promote the software industry. The organization has assisted software publishers and our customers in understanding complex software licenses by providing model license agreements to all member publishers and by offering training to software users in understanding the complexities of software licenses. Over the past three years, the SPA has provided this training to more than 2,500 IS managers and others.

The SPA is also working closely with the Clinton administration and Congress on encryption and electronic software distribution guidelines that will make it easier and cheaper for

the software industry to deliver software products electronically. It is not "sunset time," but rath-

It is not "sunset time," but rather a bright new day, full of opportunity and promise.

Bill Goodhew Chairman, SPA Washington

... but not everyone's a fan

I 'M THE PRESIDENT of a small software company, and I'm so sick of the SPA that I cheered "Yes!" when I read Maryfran Johnson's column. This organization operates in mob-like fashion, running misleading advertising and scaring the heck out of people who mistakenly think they might go to jail for making a personal copy of Microsoft Word.

Personally, I think a little piracy is good for my business. It gets our software into the hands (and minds) of users who will likely turn around and buy our software one day when they have a genuine business need for it. Kudos to you, and pants down to the SPA.

Please don't print my name or company. I don't want these mobsters appearing at my door.

Absurd thinking on Macs

Macintoshes face year 2000 issues [Letters, CW, March 3], because his Windows/Intel machines face these problems. This thinking is completely absurd. He then goes on to take a nasty poke by claiming that Macintoshes are not involved in mission-critical, data-sensitive applications. Right, the 6 million-plus Macintoshes and compatibles sold last year are all being used for games.

Rob DeMeuse Systems engineer Mauston, Wis.

ClOs don't own information

LIAN ALTER'S March 3 column ["May the CIO title R.I.P."] is right on the mark. Ever since they started the title, I have been saying from Sweden to Hong Kong that the title of CIO contributes to we/they conflict when there is already too much. It isn't their information — it's the customers'! And when the government starts using the title, I know it's a bad idea.

Robert A. Zawacki University of Colorado Boulder

Computerworld welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Maryfran Johnson, Executive Editor, Computerworld, PO Box 971, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

Autistics offer unique skills to IS

Gary H. Anthes

or many of us, the word "autism" evokes frightening images of children shut off from the world, rocking, screaming or banging their heads. And if we think of autistic adults at all, we are likely to picture Dustin Hoffman playing the odd, cardcounting "savant" in the 1988 movie Rain Man.

While not inaccurate, those perceptions fail to account for thousands of autistic adults whose special ways of

thinking make them quite well-suited for jobs in programming and computer graphics. Autism often leaves those people with poor social and communication skills while bestowing gifts of extraordi-

nary concentration and creativity.
Unfortunately, for every autistic per-

son who succeeds in the workplace, there are eight or nine who fail.

Why? It's partly bias from employers, although often the bias is unintended. One bright but socially inept autistic proFor employers able to offer the right kind of environment, the payoff can be significant.

grammer says of the job interview, "I set off every warning flag the interviewer's got. He thinks, 'Boy, I can't quite place my finger on it, but that guy is really weird.'"

The Americans with Disabilities Act of 1990 helped produce user-friendly work environments for those with physical impairments. But the special needs of those with mental handicaps aren't well-understood by most employers.

However, it isn't necessary to consult with psychologists and neurologists to understand the conditions under which autistics are most likely to succeed. In interviews for a recent story on computers and autism [CW, April 14], I asked a number of autistics what they need to be successful in the workplace.

They say they require employers who understand and respect their social limi-

tations; they need quiet, stable and predictable work environments; and they must be given very clear goals and objectives.

Teamwork isn't appropriate, they say, nor are management responsibilities.

For employers able to offer the right environment, the payoff can be significant. In the words of one autistic programmer, "We can offer dramatically innovative approaches, the ability to focus on a limited

proaches, the ability to focus on a limited number of things for extended periods to a far greater degree than nonautistics and, on occasion, savant-like abilities available from no one else."

Because autism profoundly impairs a person's ability to form emotional attachments and communicate, people sometimes assume autistics lack feelings. But in my interviews with autistics, I found depression and anger — often combined with a sort of gallows-humor resignation — at the way they are misunderstood, underappreciated and often humiliated.

Temple Grandin, an autistic professor at Colorado State University, credits "mentors" for helping her learn how to jump autism's awesome mental hurdles. She now calls on computer professionals to do the same for bright autistic kids, many of whom otherwise are headed for lives of unemployment.

Grandin tells of a bright autistic boy who recently dropped out of high school because he was bored. "If someone came along and plopped a Silicon Graphics workstation in front of him and showed him how to use it, he wouldn't be bored anymore." she says.

Autistic kids should be doing real programming, not "playing with stupid computer games," Grandin urges.

Listen to Grandin. Become a mentor. Hire an autistic person. Call your state's department of developmental disabilities or More Able Autistic People in Crown Point, Ind.

Anthes is Computerworld's senior editor, special reports. His Internet address is gary_anthes@cw.com.

Ethics and metrics aren't connected

Michael Schrage

ears ago, when most of my income came from writing about innovation, magazine editors would buy me lunch. We'd discuss story ideas and then — with the steely nerve of a Chihuahua in a paint mixer — I'd ask how much I'd get paid. Invariably, the answer was about \$1 per word.

We'd chat a bit more. Then I'd ask what problems the editors typically had with their outside writers. Without exception, every editor complained that their freelancers tended to write too long.

Duh.

This true tale of reverse incentives popped to mind while reading Measuring and Managing Performance in Organizations by Robert Austin (Dorset House, 1997), a clever analysis of the dysfunctional nature of organizational efforts to create and manage performance metrics. The book does a superb job of reviewing the massive literature in this area in a management-friendly way. It offers an intriguing economic analysis of why some metrics are more likely to evoke perverse responses than others.

I was struck dumb — mute, not stupid — by two paragraphs in Austin's book. The first was in the preface: "... I am pleased to report that by the end of this book, I have established a case for the importance of ethical behavior purely on efficiency grounds. ... ethical behavior makes things work better. ... trust, honesty and good intention are more efficient in many social contexts than verification, guile and self-interest."

The second paragraph, appropriately enough, appeared in the concluding chapter: "The fundamental message of this book is that organizational measurement is hard."

Duh

I am not a cynic. I fully support Austin's message that many organizations can create healthy cultures and ecologies of measurement.

But it's time we honestly acknowledge that issues of metrics and productivity have little to do with economic efficiency and virtually nothing to do with ethics.

MATTER OF CONTEXT

We are all kidding ourselves if we believe that our organizations are simply irrational when they implement metrics that frequently yield perverse results. On the contrary, they are being rational — we

just don't like the context of their rationales.

And yes, how many of us work in organizations where trust, honesty and good intentions



Issues of metrics and productivity have little to do with economic efficiency.

are consistently more effective than verification, guile and self-interest? Half of us? A quarter? A tenth?

The reason we have metric dysfunction in most companies isn't because organizations are inherently stupid or inefficient. It's because most organizations find it easier and less expensive to be dishonest than honest. Doubt that? How many of you are working on development schedules you consider honest?

Every organization that uses productivity metrics should have the courage and integrity to post comments on the perverse behaviors those metrics provoke. What are the real costs? How do they stack up against the benefits? That's the beginning of honesty.

Unfortunately, honesty — not competence, creativity or effort — is the commodity in shortest supply in most large organizations, not just IS. Austin's book reminds me that what matters most isn't what we purport to measure, but who we are. Of course, that's why so many people in so many companies are so unhappy.

Schrage is a research associate at the MIT Media Lab and author of No More Teams! His Internet address is schrage@media.mit.edu.

The good news about our Web-deployable software is that you can set up an office anywhere.

(The bad news is, we mean anywhere.)

Suddenly, no potential

no expansion plan too ambitious.

makes networking new locations and remote or mobile

have instantaneous access to our world-class financials, human resources,

first time, Mac and PC workstations will be speaking the same language and can access the same

supports virtually any client/server platform, and our open licensing policy lets you migrate through future

Visit us at www.lawson.com/insight or call 1-800-477-1357.





© 1996 Lawson Software

business site is too remote,

LAWSON INSIGHT™ Business Management System

employees as simple as adding browser software. End users will

procurement and supply chain process suites without sacrificing functionality. And, for the

databases. All this, at a fraction of the cost of maintaining a wide-area network. What's more, LAWSON INSIGHT

technological changes and upgrades without additional licensing fees. LAWSON INSIGHT. Because the future can't wait.

ENTERPRISE APPLICATIONS ON THE WEB? READY WHEN YOU ARE.

"To enhance their supply chain, advanced manufacturers want to open up their enterprise applications to customers and suppliers. J.D. Edwards' new Java applets put OneWorld on the Internet today."

Benchmarking Partners February 1997 "J.D. Edwards' vision of 'Internet everywhere' will make it easier for users to integrate their companies and their supply chains."

Hurwitz Group February 1997 across the Internet."

"J.D. Edwards, com
Java applications

across the Internet."

Advanced
Manufacturing
Research
March 1997

While other software suppliers are busily re-writing their enterprise applications to get them on the Web, our OneWorld™ applications are there today. With OneWorld, you can integrate your supply chain, improve customer service, and move information quickly and inexpensively throughout your entire organization. Our Web-enabled solutions include financial, manufacturing, distribution and public sector applications. You can deploy them across an intranet, an extranet, or the public internet. With OneWorld, you get to make the choice, rather than letting your software supplier make it for you. (Isn't that what open systems is all about?) If you're ready to stop browsing and get down to business, give us a call at 1-800-727-5333. Better yet, meet us on the Web at www.jdedwards.com/more/net001.htm



Netscape comes down to earth

DAVID MOSCHELLA

as anyone heard the word "Netscape" recently?
Is it just me, or is 1997 turning into a black hole for the onetime Web wunderkind? Looking back over the past 12 months, it's clear that the company has lost more than just two-thirds of its stock value.

A year ago, Netscape Communications Corp. was virtually synonymous with the Internet. Today, how many of you know the differences among Navigator, Communicator and Constellation, or between SuiteSpot and Netscape One? At a time when industry mind share is critical, the company's once-great brand strength has dissipated.

Netscape's receding fortunes have been showing up in Computerworld's research since last summer.

In the past eight months, the percentage of corporate customers who expect to use primarily Microsoft's browsers has doubled to 33%.

More worrisome, Microsoft has pulled far ahead of Netscape in Web server software, a market that is becoming increasingly segmented. Microsoft has gained clear control of the booming Windows NT business, while Netscape is relegated to the still growing but considerably less dynamic Unix space.

How did that happen?

In a column I wrote in September, I specified three ways Netscape could win against Microsoft: 1) it could sustain a significant product edge either through its own efforts or a Microsoft slipup; 2) it could find a rich partner willing to match Microsoft's freeware strategy and marketing blitz; or 3) it could get the government to force Microsoft to charge for Explorer and/or unbundle its Internet Information Server from NT.

In a November column, I argued against Netscape's shift away from the mass-market desktop and toward the Fortune 500. It was clear that the highend enterprise market would prove more difficult and lonely than the relatively open consumer space.

Unfortunately, all four factors are now working against Mr. Barksdale and company. Microsoft has broadly matched Netscape's product offerings; Netscape has settled for a long list of relatively weak alliances rather than any hard-core major vendor support; the government is apparently more worried about the proposed merger of Staples and Office Depot; and consumer marketing has virtually vanished from the company's list of priorities.

In one way, it's hard to fault Netscape.

Moschella is senior vice president of research at Computerworld, Inc. and author of Waves of Power, Dynamics of Global Technology Leadership (Amacom). His address is david_moschella@cu.com. When the stock market decided 16 months ago to value Netscape at \$7 billion, the company suddenly had a lot to live up to. Certainly, you couldn't have a \$7 billion browser company.

Netscape was clearly right to enter the server market. Where it has gone astray is in trying to become a full-service intranet provider. That made cool relations with IBM/Lotus and — until recently-

As if things weren't tough enough, Sun Microsystems has just announced an aggressive new push into the Web server software business, demonstrating that it, too, is now a Net-scape rival. After the sunny days of 1994-95, Netscape

now stands virtually alone, with all the sharks closing in fast. □



IT'S NOT HOW MUCH YOU READ.

You can read a knee-high stack of computer magazines each month and still not find the depth and breadth of news and information you'll discover each week in the pages of *Computerworld*.

As the only weekly newspaper for IS professionals, Computerworld is filled with up-to-the-minute articles on topics ranging from products and people to trends and technology. We cover it all — PC's, workstations, mainframes, client/server computing, networking, communications, open systems, World Wide Web, intranets, and more.

It's everything you need to know to get an edge on the competition.

That's why over 150,000 IS professionals pay to subscribe to *Computerworld*. Shouldn't you?



IT'S WHAT YOU READ.

Order *Computerworld* and you'll receive 51 informationpacked issues. Plus, you'll receive our special bonus publication, *The Premier 100*, an annual profile of the leading companies using information systems technology.

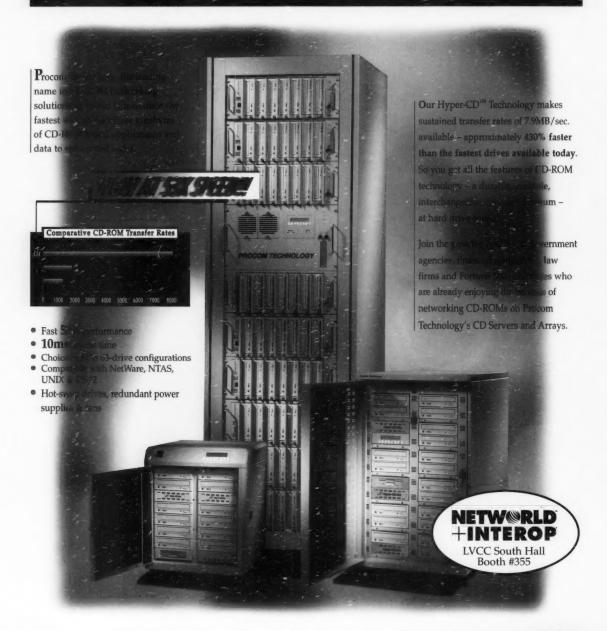
Call us toll-free at 1-800-343-6474, or visit us on the World Wide Web at http://www.computerworld.com. To order by mail, use the postage-paid subscription card bound into this issue. And get your own copy of Computerworld.

Then you can spend less time reading about the world of information systems. And more time conquering it.

COMPUTERWORLD

The Newsweekly for Information Technology Leaders

The World's Fastest Networked CD-ROMs From Procom Technology Just Got Faster.















PROCOM TECHNOLOGY INC.
2181 Dupont Drive, Irvine, CA 92612
Tel. 800.800.8600 or 714.852.1000 ext. 414
Fax. 714. 261.7380
http://www.procom.com



Servers & PCs

New ThinkPads due

IBM PC Co. within the next few months is expected to offer nped-up ThinkPad laptop machines positioned to be true

desktopreplacements.
The two new ThinkPad models will have 166-MHz Pentium MMX chips, 3G-byte hard drives, eight-speed CD-ROM drives and 13.1-in.

Pricing for the machines will range from \$6,000 to \$6,500. Industry analysts said at those prices, many users may not buy them until later in the year when the price of the units will drop.

Entry-level Alphas

Digital Equipment Corp. in: Maynard, Mass., recently introduced an entry-level workgroup and communications server that is based on its 333-MHz and 400-MHz Alpha

The Aipha 800 was designed to support Unix, Win-

dows NT or OpenYMS.

Pricing for the server will start at \$8,600 for a 333-MHz system with Windows NT, 64M-byte memory, 2G-byte hard disk drive, six expansion slots, 12-speed CD-ROM and rated 10/100 Base-T net-

Briefs SnapShot's new focus

By Tim Ouellette

IBM IS TRYING to make it so that moving data between its Ramac mainframe disk systems is a snap.

The company recently announced new features to Snap-Shot Copy, which is sold as an MVS software option for IBM's Ramac Virtual Array disk sys-

The features give users more flexibility in how they can use the product, which has been lauded by observers but not widely installed since IBM began to license the technology last year from Louisville, Colo.based Storage Technology Corp.

SnapShot Copy creates a fast copy of data pointers, not the data itself. That speeds up backup processes, or the movement of data between Ramac disk systems, and saves on the requirements for extra disk space.

For example, the Safeway, Inc. supermarket chain based in Pleasanton, Calif., has cut three hours off its weekly batch processing with SnapShot and doesn't have to take systems offline during weekend backups.

But because SnapShot soft-SnapShot Copy, page 44

WINTEL SPEC PC 98 design guidelines get mixed reviews

PC USERS may find it easier to run next year's machines and create applications for them based on preliminary design guidelines issued by Microsoft Corp. and Intel Corp.

The software and chip giants recently gave hardware engineers a look at the PC 98 Design Guideline, which calls for faster processors, a television set-like on/off manageability feature called OnNow and a single driv-

Guidelines, page 44

FUJITSU/ICL 7200 HANDHELD



- Ruggedized to withstand a five-foot
- Pen-based
- Price: \$2,635

Popularity of handhelds, smart phones building

By Mindy Blodgett

IN THE PAST few weeks, several offerings have joined the rapidly expanding handheld computer market, and more product announcements are expected in the smart-phone industry.

According to a study from Frost & Sullivan, Inc., a research firm in Mountain View, Calif., handhelds are expected to catch on in a big way in corporations over the coming years. As more workers go mobile, they will be searching for lightweight devices for data and voice commu-

According to the report, revenue for the handheld computer market, still in its infancy, is expected to reach \$1.77 billion worldwide by 2002.

HANGING BACK

At the same time, smart telephones - devices that combine cellular voice communication and digital data capabilities are off to a slower start. Diana Hwang, an analyst at International Data Corp. in Framingham, Mass., predicted 74,000 smart phones will be sold in the U.S. this year.

Handhelds, page 44

HARDWARE SUPPORT

PC 98's preliminary Design Guideline calls for hardware makers to address these issues for 1998 PCs:

- Onboard desktop management
- Quick boot-up capabilities
- Support for Universal Serial Bus technology

EVERYONE IS WATCHING THE BOTTOM LINE.

NOW YOU CAN SEE IT TOO.

As imaging becomes mainstream, budgets and the demands on technology explode. Shouldn't you facus on the monitors engineered to satisfy MIS and finance departments alike? The Nokia 445X series. Innovative FullScreen™ technology give these

21° systems a full square 19.7° workspace. The 1600 x 1200 wall of pixels boast a dot pitch of just .22 x .16 mm. And the 445X Series can achieve a refresh rate of 150 Hz. In fact. Nokia is the first manufacturer to fulfill the new VESA" standards for display clarity (which "future-proofs" your decision).

What's more, ergonomic synergies allow the 445X to deliver a range of resolutions and refresh rates mapped precisely to work in the real world. The result is a versatile tool for a spectrum of

high-resolution imaging requirements. Rigorous adherence to new TCO'95, EnergyStar, and MPR-II standards is not compromised. So your contributions to productivity and fiscal responsibility come without trade-offs.

Don't you owe it to your entire organization to consider the 445X series? If you don't, you might consider having more than your eyes examined.

Please visit us at www.nokia-americas.com or call us at 1.800.BY.NOKIA, Dept. N216.









Online backups

▶ Market for restoration services still small, rates vary

By Matt Hamblen

MARK SULLIVAN showed up at work one Friday morning to find that two disk drives on his PC had died, wiping out months of accounting records and years of personal contact and scheduling information.

Panic set in.

Then Sullivan, an attorney at Sable, Makoroff & Gusky in Pittsburgh, recalled that he had done a beta-test backup of his data with an online service about a month earlier.

"The service definitely saved my butt. I got all the critical information back."

- Mark Sullivan, Sable, Makoroff & Gusky

The service, NetTape from SafeGuard Interactive, Inc. in Pittsburgh, mailed Sullivan a diskette to help him connect to Safeguard's World Wide Web site and restore his files on a new hard drive.

"The service definitely saved my butt,"
Sullivan said. "I got all the critical information back."

SafeGuard has been providing its service since February, charging a flat annual fee of \$119. There is an additional \$24.95 fee for customers who want to re-

ceive a CD-ROM of backed-up data.

Connected Corp. in Framingham, Mass., another online backup service, charges a flat monthly fee, plus a fee for increments of data retrieval.

The market for personal and smallenterprise online backup and restore is in its infancy, and NetTape's flat-rate pricing should help SafeGuard's chances in the market, said Michael Peterson, president of Strategic Research, Inc. in Santa Barbara, Calif. Flat-rate pricing means no surprises when the bill comes, he said.

But Sullivan, who beta-tested NetTape for free, said the \$119 annual fee "seems high." He said his ideal storage and back-up offering might combine a detachable tape or disk drive and an online service such as NetTape. He said it took nearly eight hours to do the initial backup.

NetTape can be set to do backups every night or more often when a user isn't using a laptop or PC.

Meanwhile, storage vendor Stac, Inc. in San Diego recently announced that its Replica backup and recovery software, previously available for Novell, Inc. Net-Ware, is now available for Windows NT.

"[Replica] restores extremely fast," said Terry Tusher, a senior network analyst at Lithonia Lighting in Conyers, Ga.

Tusher said he rebooted and restored IG byte of data in 21 minutes, a process that would have taken one to two days. "And it didn't take a lot of expertise, either," Tusher said. "I dare say, a trained chimp could do a full restore."

uni-XEDIT - VM/CMS-style editor,

Handhelds gain in popularity

CONTINUED FROM PAGE 43

Hwang said the smart-phone market is new, so there aren't many users. She said handheld computers are catching on "through the back door — people are buying them for personal and work use, and [information systems] is starting to think they should put handhelds on their approved vendors list."

NEW TURE

Users said handhelds are sneaking in to the enterprise. J. Briscoe Stephens, a satellite systems coordinator at NASA's Marshall Space Flight Center in Huntsville, Ala., uses a Compaq Computer Corp. handheld PC with Microsoft Corp.'s Windows CE operating system.

Stephens said he uses his pocket-size handheld to read electronic mail because it is easier to carry than a notebook computer. "My lab director wanted some numbers one day, and when I just reached for my palmtop to give it to him, his jaw dropped — that I could do so much with something so little," he said.

Recent handheld and smart-phone developments include the following: ■Fujitsu/ICL Systems, Inc. in San Diego, Calif., last week announced two ruggedized pen-based handhelds, the 7200 and the 7600. They are aimed at vertical markets such as the health care, field service and transportation industries. The 7200 can run MS-DOS and costs \$2,635; the 7600 supports Windows 3.1 or Windows 95 and costs \$4,500.

Sharp Electronics Corp. last week announced the SE-5000, an organizer that will let users send and receive E-mail and synchronize data with PCs and notebooks. The SE-5000 will be available this summer. Pricing wasn't available.

Nokia, based in Finland, this summerplans to release the Nokia 9000 smart phone in the U.S. The device will let users place cellular phone calls, send and receive faxes, send E-mail and short messages, and provide Internet access. Pricing wasn't available.

■The Philips Mobile Computing Group, a division of Philips Electronics N.V. in Sunnyvale, Calif., is shipping the Velo 1, a handheld PC that supports Windows CE. Pricing ranges from \$699 to \$739.□

Design guidelines win mixed reviews

CONTINUED FROM PAGE 43

er model for Windows operating systems.

Analysts gave the specifications mixed reviews. They cheered the management features and the model for a single operating system driver model.

But analysts called some of the hardware goals too ambitious, including a proposed "device bay" that would let users upgrade PC peripheral devices without having to open a PC chassis. And analysts said the elimination of Industry Standard Architecture bus support is too much change, too soon.

GOING TOO FAR

"I think [Microsoft and Intel] are being realistic about what needs to be done with things like common device drivers. But they are pushing the edge in some places like device bay, which is still a strong 'maybe,'" said Chris Le Tocq, an

analyst at Dataquest in San Jose, Calif.

Users interviewed by Computerworld said support for the Advanced Configuration and Power Interface (ACPI) is important to them. ACPI will align hardware, operating systems and peripherals such as modern and PC cards.

"Everyone needs to start supporting the ACPI specification, which will make it a lot easier to configure machines," said Franz Field, a systems analyst at Shell Offshore, Inc. in New Orleans.

Field said he favors the common driver model because application developers still have to write for separate operating systems. But until hardware makers such as Dell Computer Corp., Compaq Computer Corp. and IBM have their say, the spec won't be finalized.

Some hardware makers, such as IBM, are already selling machines that comply with the preliminary specs. □

IBM gives SnapShot Copy a wider-angle focus

CONTINUED FROM PAGE 43

ware is sold separate from the Ramac Virtual Array and has been available only to MVS shops that use the disk array, many users haven't taken advantage of the technology. "That's something that has been holding SnapShot back," said John Webster, an analyst at The Yankee Group in Boston. "With separate pricing, sometimes users end up asking themselves if there isn't another way to do this."

SnapShot Copy includes the following:

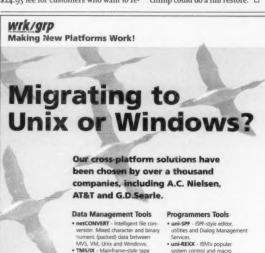
SnapShot for the VM/ESA operating

system, which has 9 million users.

■Support by December for VSAM files down to the data-set level. SnapShot currently supports VSAM only at the lessmanageable volume level.

 Better integration between SnapShot and MVS' storage management software.

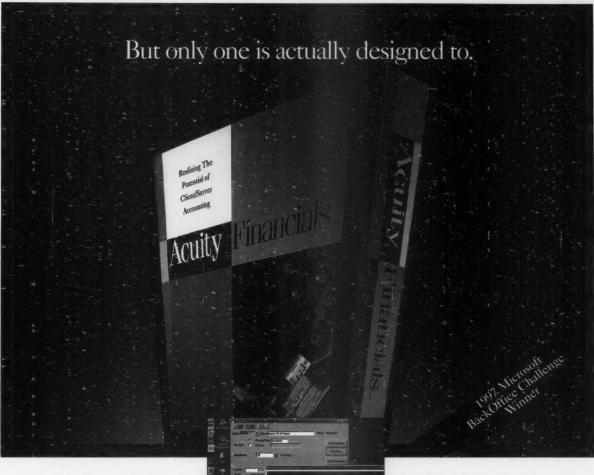
IBM also announced plans to boost the performance of Ramac Virtual Array Model 2, which will increase from 32 to 128 logical channels, nearly doubling performance [CW, March 17].



nent system for Unix and

(800) 228-0255

Lots of accounting software programs say they run on NT/SQL Server.™



Anyone can say their accounting software package runs on NT/SQL Server. But that doesn't mean it'll deliver everything it should.

Introducing Acuity Financials™ — the one people are calling the industry's most powerful, flexible, scalable, full-featured accounting application going. And the only one built from the ground up solely with Microsoft's® latest tools and technologies - including VB® 4.0 and Component Object Model.

Which means that along with offering a remarkably fast installation time, no other package is so uniquely qualified to take full advantage of the power offered by Microsoft SQL Server™ and Windows NT.

With Acuity Financials, you get a highly-polished, user-friendly interface. Built-in Crystal Reports® and FRx.® A choice of preconfigured and fully customizable financial management reports.

And features that go far beyond what you'd expect - or find in any other product.

Like complete Internet and Intranet readiness, to let you take advantage of these emerging technologies. Full Year-2000 Compliance, so your new century will be smooth sailing. And the scalability you need for a system that can grow with you.

Strength in numbers.

Amazing, to be sure. But that's what you get with State Of The Art's 15-year heritage in designing award-winning accounting software - including our industry-leading MAS 90° products.

Before you make a decision, make sure to run these numbers: 1-888-4ACUITY.

Because when it comes to accounting software designed specifically for today's NT/SQL Server,

we're not just the best choice. STATE OF THE ART We're the only choice.







sota.com. ©1997 State Of The Art, Inc. Acuity Financials, MAS 90, MAS 90 for Windoute Of The Art, Inc. are trademarks or registered trademarks of State Of The Art, Inc. er product names are trademarks of their respective companies.

Eenie

Meenie

Miney

Mo

The choice is yours: Gamble with your future, or go with a proven Year 2000 technology leader. Like Peritus.

Good choice.

Because only Peritus and Peritus' partners help you raise the right issues, intelligently ask the right questions, and assess your needs—from throughput speed to data integrity, to your ability to share data with customers and suppliers.

And, once your needs are established, only Peritus offers a full suite of alternatives that fit your specific Year 2000 requirements, from data expansion to logic correction and simple data compression. That's why more leading companies and top service providers around the world are

THERE'S A BETTER WAY TO CHOOSE THE BEST YEAR 2000 SOLUTION.

currently using Peritus as their Year 2000 partner. And why you should, too.

Our Year 2000 solutions are just part of the value Peritus can bring to your company. As the world's leader in creatively managing the installed software base, we're revolutionizing the way people think about software. And we're making more business options available to you than were ever thought possible.

The choice is yours: Take a chance, or go with the smart choice. Call Peritus today at 1-800-598-7787 for more information, or visit our web site at www.peritus.com.



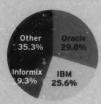
CREATIVE EXCELLENCE IN SOFTWARE EVOLUTION

Software

Briefs

1996 worldwide database market

Total revenue: \$5.78°



*Estimated

New Adaptive interface

Adaptive Information Systems, Inc. in Mission Vielo. Calif., has announced Adapt-File/VisiFlow Suite 3.0, software that combines document management, imaging and workflow with a common user interface. The client/server software supports Windows clients, Windows NT servers, Novell, Inc.'s NetWare and various Unix servers. The soft-ware is available now and

Oracle desktop tool

Oracle Corp. in Redwood Shores, Calif., is shipping a new version of its desktop query tool with a redesigned user interface and a client-level cache for storing frequently accossed data.

The Discoverer 3.0 too! was announced last fall as a replacement for Oracle's Discoverer/2000. The Windowsbased software costs \$995 per user and \$1,995 for an ad-

J. D. Edwards goes NT

J. D. Edwards & Co. has found a new home on Windows NT. announced that its OneWorld enterprise resource planning software package is available on Digital Equipment Corp.'s NT-based AlphaServers. One-World is J. D. Edwards' first NT-based package. It is available now. Pricing hasn't been

SCO boosts UnixWare

▶ Internet, clustering features added

By Jaikumar Vijayan

SCO, INC. is boosting the capabilities of its UnixWare operating system with Internet and clustering features.

The features are aimed at giving users of Intel Corp. platforms a simple way to set up Unix-based World Wide Web servers and intranets and increase availability of servers through clustering.

The Santa Cruz, Calif., company recently announced Unix-Ware 2.12, the latest version of its Unix for Intel platforms.

The release features an integrated Web server and authoring tools from Netscape Communications Corp., as well as network connectivity technologies and backup and restore services (see chart, page 49).

Such capabilities have been around for years in the RISC Unix server market, but they have only recently begun to migrate to the Intel server space.

In a related move, SCO announced its ReliantHA highavailability clustering products for the SCO UnixWare platform, based on Tandem Computers, Inc. technology. The software allows users to link up to four Intel-based servers into one cluster so that if a server fails, another node takes over automatically.

"These are interesting an-nouncements," said Bob Celmer, a technical fellow at Auto-Zone, Inc., an auto parts retailer in Memphis. The company uses SCO-based point-of-sale systems in each of its 500 stores across the country.

With these features, users can purchase relatively inexpensive Unix boxes and set up Web sites quickly," Celmer said.

"SCO is coming out with this clustering technology at a good SCO, page 49

Developers await Intel-based prime-time Java

By Sharon Gaudin

DEVELOPERS ARE hoping slowly improving Java security will let them build applications that are more critical to the business than spinning tops and barking dogs on a Web site.

Sun Microsystems, Inc. is expected by the end of the year to expand Java's security functions so applets, once safely separated from files, databases and the operating system, will be able to move across a network, read and write to files and access

Users and analysts say that should give Java the kind of power they have found only in Microsoft Corp.'s ActiveX

"We use some Java, but when we have something big we've had to go with ActiveX," said David Schrier, director of product development at Portsmouth, N.H.-based Black Diamond Consulting.

"Java applets will be a lot more useful to us if they can read and write files. ... They'll lend themselves more to real business applications."



"I'd like to use [Java] for mission-critical applications, but ... I'm just not sure it's

Schrier, whose company builds World Wide Web sites and has developed a three-dimensional imaging tool.

But as popular as Java has become, many developers haven't used the cross-platform language to build real mission-Developers, page 48

Tibco 'pushes' Rendezvous middleware

By Tim Ouelletie

Tibco, Inc. is shoving itself into the Internet "push" technology fray by tweaking its middleware product to make it a reliable, cross-platform delivery vehicle for pushed

The Palo Alto, Calif., company is shipping its Rendezvous 3.0 messaging middle-ware with new hooks to java, certified message delivery features and high-availability options for applications de-

"Push technology on the Internet is a natural fit for Tibco's products," said Ed Acly, an analyst at International Data Corp. in Framingham,

"They continue to take that technology and package it easier, though they still have work to do to adapt it to the Internet," Acly said.

Messaging middleware lets multiple applications on dif-ferent platforms share data through the use of secure, asynchronous data messages

Tibco, page 49

Forced migration worries Sybase users

By Craig Stedman ORIANDO, FIA.

SYBASE, INC. users are on a forced march to the latest version of the company's SQL Server database because support for older releases will end by the middle of next year.

And the potential for pitfalls along the route weighed heavily on attendees at the International Sybase User Group's annual conference here this month.

Several users said migration was the No. 1 issue on their

minds, dwarfing even the Eme ryville, Calif., company's plans to unify its databases with common development and administration tools [CW, April 14].

"I have my plate full for the rest of this year just getting up to the latest release of SOL Server," said Chuck Strauch, a senior systems analyst at Alberto-Culver USA, Inc. in Melrose Park, Ill.

The maker of shampoo and other personal-care items uses SQL Server 4.9.2 to track inven-Migration, page 48

When Sybase will stop supporting older databases

SQL Server 4.9.2

- **■** End of 1997 • Digital Unix
- NCR System 3000
- Sequent Series 2000
- Silicon Graphics Irix

II Mid-1998

- Digital OpenVMS
- Hewlett-Packard HP-UX
- . IBM AIX
- Sun Solaris and SunOS

SQL Server 10

- **■** End of 1997 · Most major platforms
- # Mid-1998
 - Digital OpenVMS (on Alpha-based systems only)

Developers await Java

CONTINUED FROM PAGE 47

critical applications. The problem, they said, is that the security features that make it a relatively safe language also make it relatively inefficient.

Java applets sit in what Sun calls a sandbox, a separate environment that allows the applets to execute programs without touching anything on the operating system. That operating system independence limits what the applets can do because they don't have access to files or databases.

By contrast, Microsoft's rival ActiveX components sit right on the Windows-based operating system, giving the components direct access to all Windows functionality. ActiveX, because it is built in to many Microsoft products, is more widely used than lava applets.

But what gives ActiveX its power also gives some developers security nightmares; a rogue ActiveX component could unexpectedly delete files, change stored information — or shut down a system.

KEEPING CONTROL

JavaSoft, the Java-focused division of Sun, hopes to gain some ActiveX-like power without completely letting the security horse out of the barn. It plans to enable developers to specifically control which files, hard disks and databases the applet has access to, rather than completely corralling it or giving it carte blanche access to everything. That would give a Java applet added capability while keeping its relative security. A JavaSoft

Forrester Research, Inc. estimates that 60% of businesses with 5,000 or more employees use Java. And 40% of those businesses will adopt Java as a strategic language this year. spokesperson said the expansion should be included in the Java Development Kit by the end of the year.

For example, a developer could download an applet from a tax consultant. The applet would have access to the user's tax database, and it could read and write to certain financial files. But unless the applet was digitally signed by the tax consultant, it wouldn't be accepted into the system.

Mike Nolan, a systems analyst at Houston-based Amoco Corp., said the security improvements sound good, but he added that he is skeptical about the power they will actually add to Java.

"I'm not totally convinced. Won't be until I can see it," No-lan said. "I'd like to use it for mission-critical applications, but I'm going to have to wait and see. I'm just not sure it's ready."

Erica Rugullies, a research analyst at Hurwitz Group, Inc. in Newton, Mass., said she thinks the security improvements are going to be substantial enough to pull Java right in behind ActiveX in terms of power.

Migration

CONTINUED FROM PAGE 4

tory at its warehouses.

A painstakingly clean migration to SQL Server II is crucial, Strauch said. "We're shipping \$2.5 million worth of products through the Sybase system every day, and we can't afford any downtime."

Sybase officials told customers in January that support for versions 4.9.2 and 10 of SQL Server would start being phased out at the end of the year.

Users who have migrated said the process can be fairly straightforward. But they warned of potential "gotchas" in the form of stored procedures and other pieces of SQL code that don't work properly after being moved to SQL Server II.

SQL Server II "is much less forgiving" about syntax errors and other sloppy coding, said Richard Kittinger, a senior developer and database administrator at HBO & Co., a medical software vendor in Atlanta.

As a result, he said the new database wouldn't run some stored procedures that passed muster with SQL Server 10.

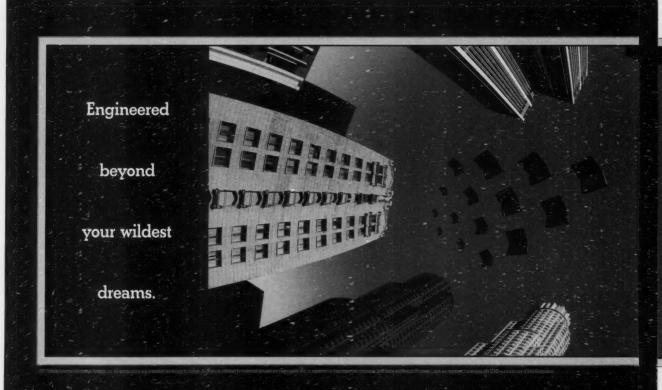
Zapping sloppy code is good, "but it can leave you with a lot of things to check and rewrite," Kittinger said. HBO & Co. also had to alter query optimization code to keep performance humming when its customer support operations were switched to SQL Server II last fall, he added.

Bowing to the migration complexities users face, Sybase officials said they will grant sixmonth support extensions on a case-by-case basis.

Extra time would help lower the risk of business mishaps, said Bob Mayes, manager of database operations at Banc One Corp.'s information systems unit in Columbus, Ohio. Banc One has to convert 200 separate SQL Server 10 databases running on 20 Unix servers, and finishing that by December could be tricky, Mayes said.

Stringent testing should catch any code incompatibilities, "but if we test everything, we'll never get it done by the end of the year," Mayes said. "We're kind of in a catch-22 situation."

On the string of the string of the year," and the string of the



Tibco 'pushes' middleware at Web SCO boosts UnixWare

held in queues

By writing to the middleware transport, developers can avoid writing complex communications code for specific hardware.

Tibco's approach to messaging, which is called publish/ subscribe, allows users to register standing requests for infor-

Tibco's Rendezvous 3.0

- * ActiveX controls for Visual Basic and PowerBuilder developers
- A Java language interface for Java applets
- Server processing of Java
- Certified messaging
- A tool kit for developers to add fault-tolerant cap-chilities to middleware

mation on a server that runs Rendezvous and have new information automatically routed to their desktops as it becomes available

That differs from the leading middleware product on the market, IBM's MOSeries, MOSeries works on a pull model, in which users request data mes-

sages from a queue only when they need them.

"What I see is that publish/subscribe technology provides an effective way to create highly scalable processing for my Web site,"

said Chuck Dornbush, president of News Village LLC, an Internet-based firm in Cambridge,

But there may be fewer differences between Rendezvous and MQSeries in the future.

Rendezvous, which has a long history of use in financial markets that need to push thousands of price changes to brokers and other interested parties, also can act as a pull mechanism, much like MQSeries. IBM officials have said they have a prototype of MQSeries that runs a publish/subscribe model in the labs.

"IBM wants to have a publish/subscribe service that

The messaging middleware market is expected to reach \$212 million this year, according to International Data Corp.

runs on top of MQSeries' backbone," Acly said.

For its part, IBM announced last week a new Internet gateway for MOSeries that turns World Wide Web data requests into MQSeries messages that retrieve the information.

Rendezvous costs \$495 per user and \$1,200 for a developer's kit.

time," said Jean S. Bozman, an analyst at International Data Corp. in Mountain View, Calif.

'They have a good opportunity as far as departmental servers go," because a lot of users are looking for the high-availability and scalability the technology offers, Bozman said.

Microsoft Corp. is trying to deliver its version of clustering technology for Windows NTbased Intel servers. Wolf Pack is being jointly developed with several other vendors. When it is announced later this year, Wolf Pack will offer two-way fail-over clustering.

For example, SCO's latest version of UnixWare comes integrated with Netscape FastTrack server for creating and managing Internet and intranet sites. It also supports Netscape's Navi-gator Gold client software for Web navigation, electronic mail and support for Web-based multimedia applications.

Meanwhile, SCO also is try-

ing to boost the reliability of its operating system by bundling in new clustering features based on Tandem's Eclipse technologies and ServerNet interconnect architecture.

The technology allows users to do fault-detection, continuous server monitoring, automated fail-over and fast recovery in the event of a server crash.

Standard components integrated with SCO UnixWare 2.12

Netscape FastTrack Server 2.0: For creating and managing Web sites

Netscape Navigator Gold 3.0: Support for Webbased video, audio and document creation

SCO PPP: Point-to-Point Protocol and Internet security protection



The new Toshiba portables. Proof that dreams do come true.

Nobody knows more about recent technological advances in the computer industry than

you do. No article goes unread. No research or review untouched. You are the tech guru in search of the

ultimate computer. Which is why, as the world's leader in portable technology, you can always rely





on us to meet your needs. And we have, time and time again. By being the first to offer you portables

loaded with the latest, most relevant technology. Like video conferencing and Intel MMX™ technology.

Introducing the Toshiba Tecra™ 740CDT. You'll find, it not only meets your expectations, it exceeds them. No

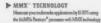
other portable comes close. And though flying portables aren't yet a reality, when they are, we'll be the

first to bring them to you. After all, our commitment to delivering you the latest technology is what

we're about. For more information about our amazing new portables call

1-800-457-7777, or visit our Web site at http://computers.toshiba.com





WIDEO CONFERENCING zapenemes tuce-to-tuce continuanciation in and out of the office With superior video quality and ease of use

- ▶ 13.3" COLOR DISPLAY Equipped with bulliant TFT color, Imagine the largest display available in a portable.
- ▶ 10X CD-ROM

16MB high-speed EDO DRAM (expandable to 144MB)

ats two Type II or one Type III 16 tat PC Cards of Video (ZV) Cards or 32 tat. Cardious Cards

Computerworld Custom Publications

Where IT Leaders Find Technology Solutions

Computerworld's custom publications are an excellent resource for learning about specific solutions on critical technology issues and challenges. Sponsored by leading IT vendors, these custom publications are produced by a dedicated custom publishing staff at Computerworld. Working with well-known industry analysts from IDC, Gartner Group and other third party sources, this group brings you a variety of special publications that provide the focused perspectives that help you effectively deliver information technology to the enterprise.

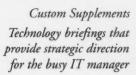
For sponsorship information contact:
Elaine R. Offenbach
Vice President
Computerworld
Custom Publications
Phone: (415) 347-0555
Fax: (415) 347-8312
E-mail: elaine_offenbach@cw.com

COMPUTERWORLD



White Papers

With an in-depth focus on a major technology platform or technology management issue, Computerworld White Papers are highly regarded by information systems professionals







Technology Roadmaps Infographic reference guides to the design and implementation of critical technology platforms

Look for These Upcoming Custom Publications in Computerworld

Issue Date	Title	Space Close	Materials Due
Apr. 21	White Paper: Data Mining Leverages Warehouse Info	Mar. 7	Mar. 28
May 12	White Paper: Evolution of Systems Management Distribution at DB/EXPO	Mar. 28	Apr. 18
Jun. 2	Solutions Series: Year 2000: Products (part 2 of 2) Distribution at PC Expo & Comdex Spring/ Windows World	Apr. 18	May 9
Jun. 23	Supplement: Application Development on the Web	May 9	May 30
Jul. 21	Supplement: Re-engineering Financials	Jun. 6	Jun. 27
Aug. 11	Supplement: Cost of Ownership: Network Computers	Jun. 27	Jul. 18

Computerworld Custom Publications are written and produced independently of the Computerworld editorial staff.

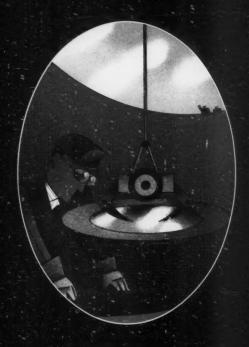
To order back issues, contact Heidi Broadley at (508) 820-8536





Data Mining:

Plumbing the Depths of Corporate Databases



COMPUTERWORLD



DB2 for Windows NT is the only universal database that can wear this nifty badge.

IBM and DB2 are registered trademarks and Cultures from the Composition of the Compositio

Is your database missing something? DB2° Universal Database lets you mix images and other complex objects of sight and sound with traditional data. Our extenders let you add new capabilities at your own pace, from scanned documents to multimedia to interactive training. Built-in Java[™] support gives you a straight shot to the Web. No other engine brings data to life on Windows NT* like DB2. For a free trial copy, visit www.software.ibm.com/info/db2nt, or call 1800 627-2938, ext. 6C7AK011, and see what you've been missing.

IBM.

Solutions for a small planet

Introduction

here's no shortage of products for gathering data. Due to advances in storage and DBMS technologies, the amount of information collected by businesses is doubling every five years.

But many organizations are having a hard time finding ways to use all that data to increase their bottom line. When data volume grows too big, few companies have the capacity to make sense of it all.

Many data access and reporting tools — RDBMSs, multidimensional analysis tools, ad hoc query and reporting software, and statistical analysis packages — let organizations probe all that corporate info. But these tools do not enable users to find patterns hidden in vast databases or pinpoint the factors they are seeking to help them make faster, more accurate business decisions.

Only data mining software
— the most complex of data
query tools — can help companies retrieve nuggets of valuable information from the
depths of their corporate databases. Data mining software
discovers previously unseen
patterns in that information by
answering vague questions
(unlike traditional data queries,

Data mining
gives companies
a way to use
corporate data
in order
to help their
bottom line.



This White Paper was produced under the direction of Technology & Business Integrators Inc. (TBI). TBI, a leader in IT outsourcing, strategy and performance measurement, provides corporations with IT-oriented business solutions. TBI also publishes the IT Services Letter, which serves both vendors and end users. TBI's client list includes Fortune 1000 companies across various industries.

TBI CO

which are specific and aimed at a particular subject).

Due to its complexity, data mining technology has traditionally been used in scientific and engineering settings since it originated in university labs. The first approaches were based on rule-induction systems, neural networks and advanced regression statistics, and early users tended to be persons skilled at analyzing such data.

But data mining is now growing common in business environments, particularly in companies with: large volumes of data; communities of users who are not data analysis specialists; and corporate data that is detailed and multifaceted, with data relationships that are ad hoc and changeable, not predetermined or even logical.

This White Paper will look at how data mining tools are providing these businesses with a better understanding of the buying patterns and product preferences of their customers, and how these companies are using this information to enhance customer loyalty and improve their bottom lines.

ILLUSTRATIONS BY MARK S. FISHER

The Secret's Out Data Mining is In

Nearly every major firm is implementing decision support systems that give end users and senior managers access to massive amounts of corporate data. But DSS systems lead to problems. Data volumes are too large and complex

for users to understand them. Users limit their data analysis to their own initial assumptions. And today's tools may be fine for accessing and reporting data, but not for doing business predictions.

The software that can handle these three problems — data mining software — is becoming common in many business environments.

Even so, many businesses remain secretive about their use of the software. In 1995, industry research firm Meta Group began a three-year quest to survey 2,000 companies, to learn the extent of their data mining activities. Little did analyst Aaron Zornes know how hard the survey would be to puli off.

"Nobody wants to talk about [data mining]," he says. "Visa, American Express, Wal-Mart, K-Mart, AT&T and MCI are all doing it but they won't tell you what they're doing."

Why are companies so tightlipped? Because "corporations who took a risk and spent a lot of money and time on data mining when it was unproven technology don't want their time-to-market competitive edge to be eroded," says A.J. Brown, vice president of worldwide marketing at DataMind Corp., a vendor of client/server data mining tools in Redwood City, Calif. "They want to leave technology laggards out there for a while."

Data mining has remained a secret for so long because it is a



Percentage of survey respondents listing each obstacle

Source: Meta Group

The NCR Scalable Data Warehouse.



Half the world relies on our data warehouses.

If you're serious about using data warehousing to gain a competitive edge, choose NCR. The company that is recognized



worldwide as the industry leader. We have the technology and expertise to help you transform mountains of data into nuggets of vital customer information. worldwide as the industry leader. We have the information, enabling smarter, quicker decisions.

Our NCR Teradata® database is the most proven and robust parallel database engine in the industry, providing you with unmatched querying power and scaling from a few gigabytes to 10 terabytes and beyond.

And our NCR WorldMark™ servers are the best platform to build your data warehouse on. Ours is the only server platform that scales from SMP, to clusters, to MPP, allowing businesses to start their data warehouse small and grow it to any size.

In the U.S., the 3 biggest retailers, 2 out of 3 top banks,

3 out of 5 top airlines, and 7 of the top 9 telecommunications companies, are already utilizing our know-how Know-how that has made us the world leader in data warehousing with over 500 production data warehouses. Know-how that can be a big plus in your race to beat the competition.

NCR Worldwide Services professionals can help you set up and maintain the most scalable data warehouse on the planet.

For more information about NCR's scalable data warehouse, call 1 800 CALL-NCR, ext. 3000. Or visit







Data Mining Software Helps Banks Improve Aim

The Bank of America (BofA) and Meilon Bank are both using data mining software to develop pinpoint accuracy in marketing and pricing financial products, such as home equity loans.

BofA's data warehouse is so vast - for some customers, there are 300 data points that traditional analytic approaches are overwhelmed. But the //Discovery suite from HyperParallel, a San Francisco developer of parallel Knowledge Discovery software, can evaluate millions of records with hundreds of variables. "We have given them 200 to 250 variables and tens of millions of records, which they have processed easily," says Dave McDonald, VP of BofA's National Consumer Asset Group (NCAG). "We don't know what their limit is."

Retail lending customers consist of those who make little use of their credit limit (low revolvers) and those who maintain a high outstanding balance (high revolvers). Each group presents marketing challenges.

Low revolvers present a low risk of defaulting and incurring write-off charges, but generate little or negative net income because the cost of servicing them is nearly the same as for high revolvers. Banks often offer them programs that encourage greater use of the credit line or identify opportunities to cross-sell higher margin products.

High revolvers consist of high- and medium-risk components. The high risk segment carries the potential for default and charge-off costs. For the medium-risk segment, marketing programs focus on retaining profitable customers and acquiring new customers with similar profiles.

But according to a new school of thought, customer behavior changes over time. Seeing who represents the greatest profit potential can only be achieved by considering the costs and revenues of customers throughout their life-cycles.

Such a detailed analysis is just part of the challenge. For each market, BofA can offer a variety of tailored product packages by adjusting fees, interest rates and features. The result: a staggering number of potential strategies for reaching profitable customers. Sifting through the vast number of combinations requires the ability to identify very fine opportunity segments.

For the project, data was extracted from the warehouse and shipped to HyperParallel. Using the vendor's //Cluster tool to discover hidden patterns, the team learned that a certain set of customers was 15 times more likely to purchase a high-margin lending product.

Next, the team used //Sequence to determine the sequence of events leading to purchasing. The team fed the parameters to HyperParallel's scalable induction algorithm and built a model for finding other customers - a model so accurate that it discovered people already in the process of applying and being approved for the lending product. Using this profile, a final list of quality prospects for solicitation was prepared. The response rate exceeded past results dramatically.

For McDonald, this is just the start. Rather than traditional large, seasonal, 500,000-piece marketing campaigns, he envisions a continuous process approach, with many small ongoing offers shaped by past efforts. He plans to continue to use the rapid analysis services of HyperParallel to develop modern analytical methods for other banking products.

Mellon Bank believes in the concept of continued on pg. 18

PERFORMANCE EVERYTHING

for data mining success

Data Mining on PC? Get Real. Fast!



Red Brick Warehouse 5.0 with Red Brick Data Mine.

The "proprietary-PC-based-network-clogging approach" is wrong for data mining.

Red Brick Data Mine is the only advanced

server-based data mining functionality fully integrated into a data warehouse RDBMS engine. Accessed through any popular front-end tool that generates SQL, Red Brick Data Mine brings the power of data

mining to 100% of your data where it lives on the server — in a relational database.

So when you're ready to get serious about data

mining, the only answer is Red Brick Data Mine.

You'll find it inside Red
Brick Warehouse 5.0, the
world's fastest and most
scalable relational database
for data warehousing,
including data marts, OLAP
and data mining.

"Red Brick's early emphasis on data mining is key to the company's continuing success as a major data warehouse platform for VLDB solutions. Red Brick's Data Mine will provide competitive advantage over singular data mining solutions as well as opportunistic marketing technical partnerships by the competition."

Aaron Zornes, META Group, October 1996

Register Now For FREE Seminar...
To attend the Red Brick "Performance is Everything" seminar in your area or to receive our free white paper "Data Mining: The Power of Integration," call 1 800 939 1845 or visit us at www.redbrick.com.



Nearly 70% of the data mining process consists of preprocessing just cleansing the data so it's ready to be mined.

Many business analysts would prefer 70% accurate results in a day to waiting a week for 90% accuracy.

complex process. According to Tej Anand, director of knowledge discovery at NCR's Human Interface Technology Center in Atlanta, 70% of the data mining process consists of preprocessing - just cleansing the data so it's ready to be mined. For users such as Steve Brown at ADP's customer service operation in Portland, Ore., the figure is closer to 80%.

During preprocessing, attention is focused on a subset of data, which is determined by a data mining discovery process done prior to the in-depth analysis. During this process, a data mining engine scours huge volumes of data and discovers "hot spots" worthy of further investigation.

MINE FASTER

To encourage broader commercialization of the technology, vendors are trying to speed up the data mining process. One theory is to shorten the time needed for data cleansing. NCR's Knowledge Discovery Workbench suite of analysis tools has a graphical desktop with filters that allow a user to move dirty data graphically to ready it for loading.

IBM has made a big investment in speeding up the data mining process. Last September IBM opened its \$45 million Teraplex Complex, where it is working on ways to optimize data mining on large data warehouses.

The complex, which consists of centers in Poughkeepsie, N.Y., and Rochester, Minn., "stress-tests" live customer business intelligence systems and applications, particularly large data warehouse and data mining projects, on IBM's S/390, RS/6000 and AS/400 families of hardware.

The types of solutions being tested, such as 15Tb warehouses, "are new to everyone," says Evangelos Simoudis, vice president of Global Business Intelligence Solutions for IBM. "We want to know how long it takes to execute a query on a particular machine, how tools interconnect and what happens when 1,000 users on one machine are using business objects simultaneously."

One way to accelerate the mining process is to trade off accuracy for speed. Many business analysts would prefer 70% accurate results in a day to waiting a week for 90% accuracy, notes Simoudis.

However, many existing data mining algorithms simply cannot deal with huge data sets. The problem, says Simoudis, is that the algorithms used in these situations were developed for a different set of conditions. "The discovery-driven algorithms often hit brick walls, especially against large data



sets," he says. "They do not always scale, and their mathematics are not very extensive. We need a new breed of algorithms that scales better and takes advantage of parallel processing better."

Current algorithms were designed for use on single-user workstations, in a file-to-file format. "Today, more people have large parallel databases with terabytes of data, but hardware vendors have provided no infrastructure for writing programs," says Allan

Razdow, president of Torrent Systems. The Cambridge, Mass., firm is trying to fill in the data mining gap in parailel computing with a development environment, called Orchestrate, for building scalable software for data warehousing.

Component-based Orchestrate hides the complexities of executing a parallel program through the use of parallel data mining algorithms. Its library of components includes a neural network that can be trained in parallel. "But it's not enough to

have good algorithms," says Razdow. "You have to have the infrastructure to deliver data to and from them."

Orchestrate lets users get data out of these algorithms with the performance they need on parallel systems. For instance, Orchestrate would allow a user to perform a parallel sort without orchestrating 100 copies of a sorting package on 100 machines.

Says one user of Orchestrate: "We had little chance of meeting our deadlines without it. It

More Questions than Answers? That's Good

Sometimes the value of data mining software is not just the patterns it finds, but its ability to help a user look at something in a new way.

The customer service operation of Automatic Data Processing (ADP), in Portland, Ore., had been using spreadshects to distill data, such as call arrival times, coming off its transaction processing system. That data was used to log wait times, determine staffing levels, and answer questions such as whether the staff did better on priority or non-priority calls.

When DataMind Corp., a vendor of data mining tools in Redwood City, Calif., approached ADP to beta test DataMind Solo last year, hardware/system support analyst Steve Brown was all for it. "In the past our tools were skimpy at best," he said. Data mining "sounded like it would let me try some things I wanted to, like statistical analysis." ADP tested the software on Windows 3.1 and is now trying out Version 1.3 of DataMind's Professional Edition under Windows 95.

One thing the software helped ADP discover

was that it was better at solving problems on Mondays and Tuesdays. Although the software can show users the components it put together to form its analysis, sometimes the reasoning is purely intuitive. In this case, Brown said, it was because companies tend to do system reboots on Monday, so "there were lots of easy fixes."

The software also showed that the seniority level of technicians did not matter much when it came to measuring the success of customer calls. That surprised people at ADP at first, until they realized the reason for that seeming aberration: The senior people take the harder calls.

"Sometimes the software opens more questions than answers, and gets you thinking in ways you weren't thinking before," said Brown. "And that's what we wanted it to do."

ADP has started using Professional Edition for larger and more complex data sets. The software's biggest limitation, says Brown, has been the quality of the data. "Cleaning data is 80% of the process," he said.

The SAS

How can we improve customer retention?

Who are our hot prospects?

What are the key demographics of our major markets:

Is credit card fraud on the increase?



Data Mining Solution

Discover the Diamonds in Your Data Warehouse

Introducing the first-ever, fully integrated data mining solution...one that maximizes your return on investment in data warehousing and data marts—as decision makers exploit your customer data for competitive advantage.

SAS Institute, for 20 years the leader in data discovery, provides the most complete and reliable data mining solution for modeling, measuring, and enhancing the profitability of your business. This Web-enabled, point-and-click approach lets you employ OLAP, neural networks, churn analysis, and other analytical and visualization techniques to improve customer retention, target key prospects, profile market segments, detect fraud, analyze customer response, and much more.

Begin Your Discovery with our Free Web-Integrated CD ROM

Digging for Diamonds: The SAS® Solution for Data Mining lets you explore data mining from both a business and an IT perspective. And it's linked directly with our World Wide Web site, so you can continue to make new discoveries and gain fresh insights.

To request your copy, visit SAS Institute at www.sas.com/datamining/ or give us a call.





E-mail: cw@sas.com www.sas.com/datamining/

919.677.8200 In Canada 1.800.363.8397

The rush to fill the demand for data mining tools has attracted a diverse group of suppliers.

Venture capitalists view data mining as the next step in the 12-year-old and still lucrative DBMS marketplace.

takes away the headaches of parallel programming."

The rush to fill the demand for data mining tools has attracted a diverse group of suppliers: computer manufacturers like IBM and NCR; reborn AI vendors; RDBMS suppliers; upward-thinking OLAP vendors; and parallel processing expatriates. Both Thinking Machines Corp., in Bedford, Mass., and NeoVista Solutions, the Cupertino company once known as MasPar Computer, abandoned the hardware business to concentrate on data mining software.

And start-ups like DataMind and HyperParallel continue to enter the market, courtesy of funding from venture capital firms, who view data mining as the next step in the 12-year-old and still lucrative DBMS arena.

DBMS vendors are also intrigued by data mining. Oracle, Informix Software, Sybase and Red Brick Systems are all

encapsulating data mining functionality in their SQL engines. Red Brick, in Los Gatos, Calif., integrated data mining functionality into Version 5.0 of its data warehouse RDBMS last fall. Its Red Brick Data Mine Option is server-based software that can be used to read very large volumes of data; its Data Mine Builder is a GUI-based tool for Windows PCs.

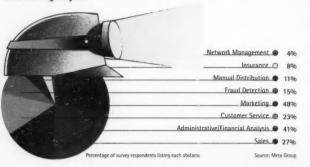
The data mining club also includes Tandem Computers, the Cupertino vendor of faulttolerant systems and a DBMS. In February, the company introduced its Object Relational Data Mining architecture, which establishes a standard SQL interface between clientbased data mining tools and object relational (as well as simply relational) database engines.

The database engine performs the data manipulation functions required by the data mining algorithms. According to Tandem, this will reduce processing time and make management easier.

STANDARD NEEDED

However, the industry still needs a standard method for data mining encapsulation in RDBMSs. "We have to come up with a knowledge discovery query language," says Anand, noting that if a knowledge discontinued on pg. 16

Functional Areas Driving Current **Data Mining Projects**





High-Performance Data Mining for Business Professionals

PACKARD

Enterprise Servers

NEURMATION

Enterprise Scalable OLAP

hands of your business users so they can get more customers coming, keep fewer from going, and understand why zig is not always followed by zag. Together, Brio Technology, Hewlett-Packard, Information Advantage, and DataMind have teamed up to provide you the right combination of high-performance data mining for complex data sources and a selection of analysis tools that any marketing person would cry for. Call and discover for yourself one way data mining can make a difference today.

Data MIND

Call 1-888-DataMind

for your free information about customer analysis using data mining.

www.datamindcorp.com

Mining the Lärgest

Data Warehouse

ata mining and data warehouses are closely related. Once viewed as a subset of the activities associated with a data warehouse, data mining today directly influences the design

and implementation of large data warehouses.

Data mining is often performed beside the warehouse, with discovery and prediction analyses performed in the mine. Data is moved from the warehouse to the mine where it is restructured, transformed and analyzed. If the warehouse is a massively parallel processing (MPP) computer, the mine may reside as a separate repository in the warehouse.

Although data mining caters to a different group of users than the typical warehouse, the technology can help companies focus on the most important information in their warehouses. For instance, when data mining tools are implemented on client/server or MPP computers, they can be used to analyze massive databases and get answers to questions such as, "Which clients are most likely to respond to my next mailing, and why?"

Many companies specialize in large-scale data warehousing solutions. One of them is NCR, whose solutions consist of its WorldMark 5100M server, Teradata parallel processing RDBMS, and consulting services in the areas of database design, data transformation and data management.

NCR also offers a Management Discovery Tool that allows users to mine data for changes over time in sales performance indicators. The product displays mining results to users in natural language, text, tables and graphs, or as HTML documents so they can be delivered over the web. NCR has also started using HyperParallel's Discovery suite in its data mining tools.

In February, megaretailer Wal-Mart expanded its existing relationship with NCR to increase the size and information analysis capabilities of its data warehouse by adding new customer preferences data.

NCR agreed to supply one new 5100M MPP server and to upgrade an installed 5100M to 96 nodes. The two servers, which run the Teradata RDBMS, will triple the size of Wal-Mart's warehouse to over 24Tb. With the increased



capacity, Wal-Mart retains its ability to boast having the largest commercial data ware-house in the world. More than 30 applications run on the system, which handles as many as 50,000 queries in one week.

The expansion of the warehouse was needed because of Wal-Mart's dependence on detailed data at every level to execute its business strategy. The retailer analyzes every cost and every line item.

Although Wal-Mart's data warehouse incorporates information on a nationwide basis, that information can be tailored by individual stores to give merchandise buyers insight into local purchasing patterns.

Information in Wal-Mart's data warehouse is collected from the retailer's 2,900 stores and used to enhance its decision support system. Using the 65 weeks of data kept by item/by store/by day, Wal-Mart buyers can query and analyze customer buying trends to make decisions on replenishment and mark-downs.

Reuters, a provider of news and realtime information to 340,000 users, also turned to NCR to increase the size and capabilities of its data warehouse earlier this year.

NCR will supply five 5100M servers that will be integrated with Reuters' existing NCR 3600MPP systems running Teradata and NCR's Top End enterprise middleware software. The result: a 500Gb data warehouse, one of the largest in Europe.

According to Tej Anand, director of knowledge discovery at NCR's Human Interface Technology Center in Atlanta, large data warehouses are good environments for data mining. Such warehouses provide multidimensional indicators of business problems, facilitating the understanding of cause and effect. "We see data mining as the next step for data warehousing," says Anand. +

Retail nuances

The process by which a retailer analyzes the contents in a customer's shopping cart is called market basket analysis. By discovering affinities among the items, a retailer can in theory deepen its understanding of its customers. For instance, a retailer who discovers that customers tend to buy one product with another can make those products easier to buy together.

But understanding consumer buying patterns involves nuances such as sales cannibalization and forward buying. A tavern might cannibalize its sales by trying to lure more customers with a low-priced domestic beer. Although some new customers come to the tavern, the new business is offset by exist-

ing customers who switch from high-margin imported beers for the cheaper domestic product. Sales increase, but profit margins suffer. "As a retailer, you have to ask when a sale cannibalizes a more profitable product," says Bill Nowacki, vice president of marketing at HyperParallel, a vendor of data mining tools.

As for forward buying, take the guy who buys a six-pack of his favorite beer every week. When the store runs a sale on cases of that beer, the customer decides to stock up. Figuring out whether the retailer is better off financially selling by the six-pack or case is no easy matter. "It's not just a point in time but over time as well," says Nowacki.

Suppliers of lower-end data mining tools are more concerned with usability than with probing humongous data volumes.

> Another way vendors are expanding the usability of data mining products is by jumping on the 'Net bandwagon.

continued from pg. 12 covery task could be represented as simple parameters in a DBMS engine, data mining would be more commercial.

While high-end suppliers try to get data mining processes to work in parallel across many processors in large databases, suppliers of lower-end tools are concerned with usability more than probing humongous data volumes.

For instance, SAS Institute Inc., in Cary, N.C., is bringing the power of data mining to even the most unsophisticated users. Its client/server data mining tool, Enterprise Mining, which works with its Orlando 2 data warehouse suite, is about to go into beta. Enterprise Mining will let marketing and sales staffs create statistical analysis models. Built with a GUI, the product includes tools that walk users through the model-building process so that those with little model-building background can take advantage of data mining systems.

DataMind is confronting the usability issue with an architecture that consists of two components: DataCruncher for server-side data mining and Professional Edition for clientside specification and viewing of results.

Users deploy Professional Edition as a Microsoft Excel spreadsheet add-in, giving them an easy-to-use interface driven by icons, menus and wizards, with output displayed as graphs and spreadsheet reports.

Implementing Professional Edition "was simple," says user Brown at ADP. "No additional hardware was needed. You throw in a disk, push a button and away you go."

NET FOCUS

Another way of making data mining more usable is by jumping on the 'Net bandwagon. The DecisionSuite set of relational OLAP tools from Information Advantage, a Minneapolis vendor of business analysis software, provides ad hoc analysis in a unified web/Windows environment to share reports across browsers and PCs. Another product, WebOLAP, allows an organization to put its data warehouse on an intranet and perform multidimensional OLAP analysis using web browsers.

IBM recently announced it would deliver Internet-based data mining through its net.Mining solution. This includes Surf-Aid, which helps businesses determine who is accessing their web sites, what they are looking for, and how to structure the sites to best meet users' needs. IBM has also announced Product Discovery and Customer Discovery, two web-enabled applications for its



MINING YOUR TERABYTES OF DATA DEMANDS INDUSTRIAL-STRENGTH SCALABLE SOFTWARE

ORCHESTRATE makes it easy to build and run industrialstrength data mining systems.

Your scalable machine and parallel database are online.

You want that huge payback, but few scalable data mining tools exist, and those that do, don't plug-and-play with your big data.

Applications built with ORCHESTRATE scale up to run on hundreds of processors against terabytes of transaction

data. Or scale down to run on your SMP data mart without having to change a line of code. Amazingly, these

applications are then portable across platforms and machine architectures.

ORCHESTRATE has advanced data mining

components for predictive modeling and clustering. These include versions of neural networks, decision trees, probabilistic networks, and generalized regression.

Without industrial-strength data mining tools you can't exploit your SMP or MPP investment.



Build scalable enterprise systems with Orchestrate

With ORCHESTRATE you and your parallel computer can dominate even the heaviest torrents of data in record time.

Call TODAY to learn more about ORCHESTRATE'S power.



www.torrent.com 888.339.4605

Banks Use Data Mining Software continued from pg. 6

"mass customization to a segment of one" being able to identify and target market to the ultimate customer. However, to do this, specific information about the characteristics of that ultimate customer is required.

Data mining tools provide Mellon Bank with the means of obtaining such information. The bank has run IBM's Intelligent Miner data mining software on the RS/6000 platform under AIX, and is now piloting the software on an S/390, with plans to run it on an RS/6000 SP2 in a parallel computing environment later this year.

The bank's pilot data mining project employed Intelligent Miner in an information discovery process in the Retail Bank marketing department. The main purpose was to determine the propensity of a current Mellon customer to purchase a specific additional product: the Home Equity Line of Credit. The tool yielded models that performed well in testing.

According to a bank official, "Intelligent Miner allows the user to produce high-quality business intelligence, such as association, classification or regression analysis, upon which target marketing can be conducted to customers determined to have a high propensity to purchase the bank's products and services."

A high level of quality information was being returned for analysis and decision-making processes, according to the official, who attributed that to the product's algorithms. The official also gave high marks to Intelligent Miner's ability to be customized.

But the official suggested that the product's GUI front-end should be modified to make it easier for the average business analyst to use. Tighter integration with data preprocessing tools, such as SAS programs, would ensure "a high standard of data integrity" in the data mining process, he added.

was created by Computerworld Custom Publications, Questions or comments on the main story should be forwarded to managing editor Peter Bochner at (508) 820-8289 or peter_bochner@cw.com.

CW Custom Publications has also recently published White Papers on the related subjects of data marts (11/96), Universal Servers (7/96) and data warehouses (6/96). For reprints of the current White Paper or these previous ones, contact Heidi Broadley at (508) 820-8536 or at heidi_broadley@cw.com.

Intelligent Miner data mining toolkit. Intelligent Miner is a collection of algorithms that lets users extract, analyze and validate information from data in both flat files and databases.

COMPLEX ARRANGEMENTS

Many firms are turning to acquisitions and technology partnerships to enter the data mining arena. Sometimes these arrangements are highly complex. For instance, when Tandem entered the data mining arena, it partnered with five firms: Angoss Software International, Data Distilleries, Magnify Inc., NeoVista and Syllogic.

In 1996 Cognos Corp., a vendor of data analysis and reporting tools in Burlington, Mass., acquired Right Information Systems, Newburyport, Mass., for its high-end OLAP technology. In February, Cognos unveiled its Scenario desktop data mining software based on technology it had licensed from Angoss. A second release will incorporate neural network modeling and forecasting technology that Cognos acquired from yet another company. +

Transaction no. 009511265

AT 6:32 PM-EVERY WEDNESDAY, OWEN BLY BUYS DIAPERS AND BEER, DO NOT JUDGE OWEN

ACCOMMODATE HIM.

If a data mining query discovers that between 6 and 8pm men buy diapers and beer, chances are you'll sell more diapers and beer. It's with this kind of valuable—and sometimes odd—information mined from company databases that Tandem is helping people in retail, banking, telecommunications and insurance uncover business opportunities. And coupled with our reputation in handling 90% of the world's stock transactions, 80% of all ATM transactions, and 66% of all credit card validations, our decision support solutions are as reliable as they are insightful. Contact us at www.tandem.com for more information. Or call 1-800-NONSTOP, ext. 8001 for our latest DSS Manager's Kit including the new Object Relational Data Mining" white paper.

Every second, every transaction, every customer counts.



© 1997 Tandem Computers Incorporated, All rights reserved, Tandem. Object Relational Data Mining, NonStop, "reliability, no limits" and the Tandem logo are either trademarks or registered trademarks of Tandem Computers Incorporated in the U.S. and/or other countries

Microsoft SQL Server

thinks you should consider

spending a couple million on your data warehouse.

(Then reject that idea, chuckle heartily to yourself and come visit our Web site.)



There are a couple of things that make Microsoft® SQL Server" the smartest foundation for your data Thanks to the Alliance, you know Microsoft SQL solution will avoid the (potentially huge) setup and administration expenses associated with the other, more complicated approaches. Second, there's the Microsoft Alliance for Data Warehousing. an association of industry leaders formed to help foster standards and

ensure interoperability across products and systems. warehouse solution. First is cost: a Microsoft SQL-based will integrate with other products. Which in turn saves you time and trouble and, come to think of it, more money. All told, Microsoft SQL Server is the simplest, most flexible and most affordable approach to data warehousing on the market. For all the details, visit our Web site at www.microsoft.com/sql/.

Microsoft

Where do you want to go today?° www.microsoft.com/sql/









Pilot Software Praxis International Inc.





The Enterprise Network

LANs + WANs + Network Management

NetWare 'net access

erdeck Corp. in Marina Del Rey, Criif., last week re-leased Quarterdeck IWare Connect 3.0 (QD IWare), a Net-Ware Loadable Module that provides multiple Novell, Inc. users with the ability to connect to the Internet and intra-nets without having to install separate TCP/IP stacks and IP

QD IWave pricing ranges om \$995 for a five-user li-cuse to \$7,995 for a 100-user

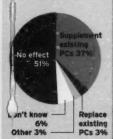
Fault-tolerant NT

Marathon Technologies Corp. in Boxboro, Mass., has repment. It lets busin sect Intel Corp. Pentium Pro systems that run Windows NT in order to operate them as a single fault-tolerant server, it is available now; pricing starts

NT CD sterage

Cirrus Technology, Inc. in Frad-erick, Md., last week introduced Jewel software, which lets users retrieve data stored in jukeboxes from Windows NT systems, using corporate intranets and the internet as transport. It will ship May 18

How will synchronously connected network computers affect the use of dial-up messaging this year?



Base: 150 IS professionals

Briefs Microsoft's cost-cutting helps users

New wizards simplify troubleshooting

By Laura Di Dio

A MICROSOFT CORP. strategy to cut its support costs by letting users solve their own problems using electronic means is paying off for users.

In March, the company began rolling out a series of Troubleshooting Wizards on its World Wide Web site.

The wizards are the latest in a series of self-serve troubleshooting utilities Microsoft has built for many of its products.

SAVE YOUR DIME

The wizards - 27 in all - are free software tutorials designed to help users fix minor problems without calling Microsoft technical support. Such calls can cost users \$150 or more and strain Microsoft's support organization. Large organizations can use the wizards to quickly solve routine glitches and common network configuration or interoperability problems, Microsoft officials said.

The company also has broad-

ened the scope of its online technical support, called KnowledgeBase, to let users file incident reports online. Most Microsoft online support requires payment by credit card or bills to an existing account.

Automated and self-help support have become common among server vendors, according to Bob Sakakeeny, an analyst at Aberdeen Group, Inc. in Boston. Sun Microsystems, Inc. Solaris servers that run Oracle Corp. databases come with an option to "phone home" automatically to support centers that supply online databases similar to Microsoft's, he said.

Cost-cutting, page 55



Microsoft's Troubleshooting Wizards cut Windows NT installation time by one-third

INTERNETWORKING Read maps don't ensure vendors won't lose way

By Bob Wallace

USERS SAY internetworking technology road maps are often vague and rarely useful, but they still shy away from vendors that can't at least lay out a plan for the future.

"It's important for a vendor to have a clear road map for developing products that all [its] divisions agree on. But some plans are nothing but grandiose ideas, and 90% of the content ends up not interesting me," said Jerry

Sobieski, parallel systems manager at the University of Maryland's Institute for Advanced Computer Studies in College

Sobieski - who used to lay out road maps himself as a technical support representative at Unisys Corp. — acknowledged that vendor plans were designed more to help vendors coordinate product development and marketing than to help users plan for the future of their networks.

The best vendor plans ensure all divisions in a company are headed in the same direction so users won't get stuck with a series of products that don't interoperate, said Jim Hutchinson, network manager at Children's Hospital in Boston.

Playing Domino

Notes vs. Web still a political battle

By Barb Cole-Gomolski

IT STAFFERS who push Lotus Development Corp.'s Domino as a Web server are finding themselves in hot debates with colleagues who favor purer World Wide Web offerings.

Although product politics aren't uncommon in information technology shops, the introduction of Domino pins the ever-loyal Lotus fans against Web purists who view Domino as a proprietary server.

"We have an Internet group here that will lambaste [Domino] at any chance," said John Sinclair, manager of electronic commerce for the consumer products group at Bristol-Myers Squibb Co. in Stamford, Conn. The pharmaceutical giant has about 20,000 Lotus Notes seats and is migrating to Domino 4.5, which includes built-in Web server capabilities. Sinclair said improving Domino's access to documents stored in relational databases would improve its chances of beating out Netscape Communications Corp.'s Suite-Spot and Microsoft Corp.'s Internet Information Server (IIST as a Web server.

Some Web purists scoff at Domino because they believe its connection with Notes makes it proprietary. Not so, say the Domidiehards. They sav Domino is as



server and stronger in security and replica-

Whereas traditional Web servers offer up Hypertext Transport Protocol (HTTP) data, Domino translates data on-the-fly from a

'Proprietary' Domino, page 53

Report tool shows big WAN picture

By Patrick Dryden

VENDORS OF network performance monitoring tools are trying to let managers of wide-area networks see the WAN forest instead of the trees.

The goal is to give business managers a broad view of the network and let them verify service levels, monitor overall WAN delivery and plan capacity needs, all from browsers on the corporate intranet.

Network managers said timely reports can help them slash WAN costs 20% to 50% by revealing actual traffic performance. They can determine whether WAN links are over- or underutilized and whether carriers deliver on promised service levels.

"We can focus on individual frame-relay circuits between 135 sites, but we don't have a global picture of the whole network," said Roger Hall, data communications operations manager at

WAN view, page 57

WAN OVERVIEW

The three phases of Visual Retworks' plan to add networkwide reports on WAN performance

Phase I - June

- Errors per line and port
- Congestion per circuit
- Traffic load analysis
- Capacity per port and circuit

Phase II - September

- Delay, data delivery rate
- Availability per line, port and circuit
- Quality assessment
- Problem analysis

Phase III - December

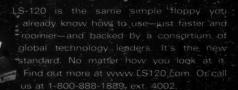
- Summary of carrier services
- Automatic baseline trending

Looks like a floppy drive. Feels like a floppy drive. Works like a floppy drive.

(A 120 megabyte floppy drive.)

LS-120 technology. The first high capacity storage system compatible with 3.5" diskettes.

Take a good look at the next PC you buyand make sure its floppy drive has the LS-120 Advantage: hassle-free, high-capacity storage. Only the LS-120 drive can give you 120 MB of floppy capacity, higher performance, and the ability to read and write to the 1-44MB and 720K floppies you use all the time.









O.R. TECHNOLOGY



maxell



Panasonic

SIEMENS NIXDORE

Circle of aniid logo is a frademark of Imation. All other trademarks are properties of their respective comprises. Imation 1997.

Road maps don't ensure vendors won't lose way

CONTINUED FROM PAGE 51

Even when they are coordinated, road maps play a small role in Sobieski's buying decisions. "I choose a vendor not so much on what they say they're going to do, but more on their performance over the last several years," he said. "Have they lived up to my expectations?"

But vendors can risk losing business by operating without a vision or by failing to share it with users.

VISION QUEST

"We've decided against a vendor in part because they didn't have a direction or vision," said Tom Stenson, vice president of network architecture and planning at State Street Bank and Trust Co. in Boston.

"I realize that things move so quickly in the industry today that it's probably impossible to have anything beyond a two-year road map, but vendors still need to articulate a plan," Stenson said.

Plans that are long on vision and short on product specifics, however, leave Hutchinson unswayed. "I listen to their talk and then ask, 'What products are you going to use to fulfill this architecture?'" he said. "You have to take these with a grain of salt." One shortcoming of vendor direction plans is that they rarely address the needs of users who buy from several vendors, according to Alan Robson, director of network systems at Cox Target Media in Largo, Fla.

"It's important for these direction statements to lay out what the technology will or won't do when used with other vendors' products," Robson said.

But having an early voice in the direction of development is the best way to en-



State Street Bank's Tom Stenson said some vendors' lack of a direction or vision has contributed to the bank not doing business with them

sure plans go your way, said Robson and Hutchinson, both of whom joined vendor technical advisory committees to make sure they have input.

"It's great to have access to the people who are actually planning and developing products," Hutchinson said.

"It's your job to learn as much about your suppliers' plans as possible," Hutchinson said. "And this is one solid way to do it."

'Proprietary' Domino makes Web purists chafe

CONTINUED FROM PAGE 51

Notes format to HTTP. Domino also has many features not found in other Web servers, such as time-tested messaging, calendaring, scheduling and replication.

Denver-based US West Communications, Inc. recently decided to center several mission-critical Web applications around Domino — a decision that hasn't always been popular with IT staffers.

"Some developers prefer to work with the products they feel are more challenging, such as the newer [Web] servers,"

"We have an Internet group here that will lambaste [Domino] at any chance." — John Sinclair, Bristol-Myers Squibb

said Motti Goldberg, chief architect at US West. Domino's strong application development environment, as well as the telecommunications giant's army of experienced Notes developers, helped IS executives choose Domino.

Adam Kornak, a Domino consultant in the Chicago area, is helping another large telecommunications company expose some existing Notes databases to the Web using Domino.

"This is very political because the company is Microsoft-oriented," he said. Several IT staffers are interested in Exchange and Microsoft's IIS, said Kornak, who had to locate a spare server on his own to get Domino up and running at the site.

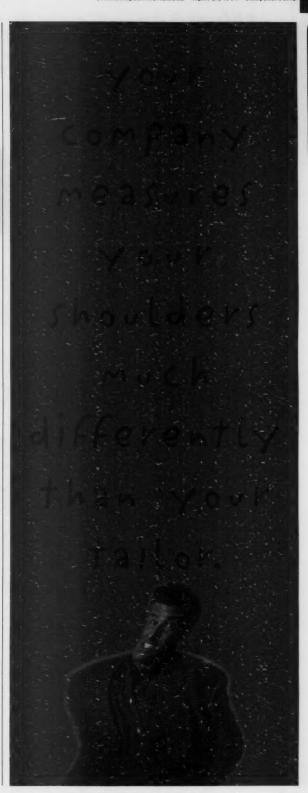
The advantage of using Domino for the publishing application is that the data already exists in Notes, Kornak said.

There are definitely Notes and Internet camps, said Angela Finney, product marketing manager at Lotus. But she added that she sees the two groups coming

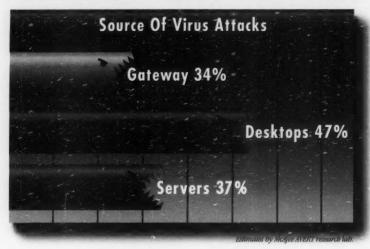
The Cambridge, Mass.-based company will try to encourage detente by making its application development tools for Domino more similar to popular Web tools.

In fact, Lotus last week announced Lotus Go Pro, a stripped-down Web server that supports HTTP natively but lacks other Notes baggage such as messaging and threaded discussion forums. It will ship this summer.

Domino seems to be holding its own in the Web arena. Creative Networks, Inc., a market research firm in Palo Alto, Calif., recently published a survey of 50 IT professionals that showed 17% of companies use Domino within their corporate intranets.



WHY VIRUSSCAN ISN'T GOOD ENOUGH TO PROTECT YOUR NETWORK.



INTRODUCING MCAFEE TOTAL VIRUS DEFENSE."

VirusScan detects 100% of the viruses on the desktop. But that's not the only place viruses attack.

Networks make business more productive. Unfortunately, they're also vulnerable to viruses at literally hundreds of points.

But there is a solution: McAfee Total Virus Defense. The only complete set of solutions that protects all the vulnerable points on your network. From desktops and groupware connections to servers and gateways.

If you're not completely protected, you're completely exposed.

McAfee Total Virus Defense uses the industry's top-rated anti-virus technology to provide unparalleled protection throughout your entire enterprise.

VirusScan is the industry's most effective, and most popular, anti-virus solution. With the new Hunter™engine VirusScan 3.0 detects 100%* of macro viruses, boot viruses, and other types that attack the desktop.

McAfee Enterprise — Me!			
Network Security		Network Management	
Desktop Security Suite	Gateway Security Suite	Saber LAN Workstation	McAfee Service Desk

McAfee anti-virus products are components of a fully integrated NT-centric systems

NetShield, the industry's leading server protection, guards your network by stopping viruses at the server level. GroupShield protects groupware users whose dynamic messaging environments are great for transporting data and transmitting viruses.

And WebShield protects you against viruses from the Internet, the latest and most efficient way to spread viruses.

Enterprise-wide solutions, desktop control.

McAfee's new Security CommandCenter gives you powerful, centralized anti-virus

management. You get enterprise-wide distribution, flexible alerting, and comprehensive reporting-all controlled from one console

Of course all McAfee virus products include support from AVERT, our Anti-Virus Emergency

Response Team. With research centers worldwide, you get 24 hours a day, 7 days a week online support - plus daily virus file updates.

And, for Internet users, our unique SecureCast feature automatically sends updated virus detection files and alerts directly to your PC to protect you from the latest virus attacks - like the new Office97 macro viruses.

For more information, including an interactive CD and a white paper on network anti-virus software, just call us at

1-800-332-9966 dept. 32.

Because only McAfee Total Virus Defense is good enough to protect your network.

Network Security & Manager

100%



www.mcafee.com

ftp:mcafee.com BBS: (408)988-4004 America Online: MCAFEE CompuServe: GO MCAFEE

*Detection rate based on results from independent industry research using Abvil technology and McAfee-Hunter engine.
Telephona (408)988-3832 Fax (408)970-9727 © McAfee Associates, Inc., 1997. All rights reserved. All brands and products are trademarks of their respective holders.

Cost-cutting saves users support costs

CONTINUED FROM PAGE 51

Troubleshooting Wizards save time and money for users who don't have Windows NT specialists on hand at all times, said Paul Soares, vice president and general manager of Alden Buick Pontiac, a General Motors Corp. car dealership in Fairhaven, Mass.

Alden is one of 8,500 GM dealers nationwide that use the Troubleshooting Wizards to smooth a migration to Windows NT. "The wizards got our Windows NT workstations up and running on the network in about 30 minutes. Without the wizards, it took us 90 minutes," Soares said.

He estimated that the wizards will save the dealership between \$2,000 and \$3,600 per year in telephone support costs.

INFERRED TROUBLE

The Troubleshooting Wizards resemble agents in Windows 95 that solve simple use and interoperability problems, but the wizards are based on a new inference engine that chooses the most likely reasons for user problems.

Users who click on the Help option are directed to the wizards, which pose questions aimed at identifying the problem and the fix.

Britt Mayo, director of information technologies at Pennzoil Co. in Houston, said the combination of the Trouble-shooting Wizards and the online support information has been an "immense help," especially with things that go bump in the night.

"They're handy when we need detailed information on a problem at 3 on Saturform morning when it's not easy to get the right support person. The wizards also give us an idea of whether or not a prob-

The diagnostician is in

Microsoft's new Multimedia Application Troubleshooting Wizard is the prototype for many Troubleshooting Wizards that will use diagnostic utilities to help users solve problems.

The multimedia wizard goes beyond asking users a series of questions; it also prompts them to choose whether or not they want to use network diagnostics. If so, the utility will perform to test operations to cover the most common reasons that would prohibit successful installation of a multimedia application.

Microsoft's next step will be to release Troubleshooting Wizards later this year that let users type in the symptoms of a problem. The system will then select the appropriate troubleshooter.

Users can learn about and access the multimedia wizard for free at Microsoft's Web site at www.microsoft. com/support/tshoot/multimedia.htm.

- Laura CiOio

lem is peculiar to us or an industrywide glitch," Mayo said.

Nine times out of 10, Jeff Dazell turns to the wizards and KnowledgeBase before calling phone support because the provide more information than the first Microsoft technician who picks up a support call, he said. Dazell is LAN administrator for corporate support at Dana Corp., a \$7 billion auto-parts manufacturer in Toledo, Ohio.

The free support has even made momey for the Electronic Brokerage Division of Charles Schwab & Co. in San Francisco, according to Mike Sidell, senior manager of business systems. The best phone support for his 11,000 users typically takes 20 to 30 minutes to solve a problem, whereas staffers can fix most problems in 10 minutes with electronic support. "Time is money in the brokerage business. If our users can't access a database or server for even 15 minutes, we lose tens of thousands of dollars," Sidell said. □

NEW PRODUCTS

BLUE WATER SYSTEMS, INC. has announced NT Developer's Power Pack, a package of Windows NT device driver development tools for C++ developers.

According to the Edmonds, Wash., company, the package includes a driver development wizard for automatic creation of thousands of lines of source code and debugging extensions.

Pricing for NT Developer's Power
Pack starts at \$1,090.
Blue Water Systems

(206) 771-3610 www.bluewatersystems.com

GEODESIC SYSTEMS LLC has announced Version 3 of Great Circle for Windows 95, Windows NT and Sun Solaris 2. The software automatically eliminates memory errors from C and C++ programs.

According to the Chicago company, Great Circle is a Dynamic Link Library that uses garbage-collection technology to analyze and manage an executable program's memory during runtime. The latest version includes a graphical user interface that tracks memory savings and leaked memory and decreases program memory requirements by up to half. Pricing starts at \$695.

Geodesic Systems (312) 832-1221 www.geodesic.com all the KEYS are in your hands.

CHANGE IS AN INSOMNIAC. AND A CONSTANT BUSINESS COMPANION. BUT COMPANIES LIKE MICROSOFT, ADP AND ROCKWELL AREN'T SIMPLY SURVIVING THE REVOLUTION. THEY'RE THAIVING ON IT. WITH HELP FROM CLARIFY. WE PROVIDE FRONT-OFFICE SOLUTIONS—APPLICATIONS THAT HELP MANAGE CUSTOMER RELATIONSHIPS—INCLUDING SALES FORCE AUTOMATION, CUSTOMER SERVICE, FIELD SERVICE, HELP DESKS AND QUALITY ASSURANCE. WE'RE FOCUSED ON CUSTOMER SUCCESS. OURS AND YOURS. THE NELCOME MAT'S OUT AT WWW.Clarify.com (1-888-clarify).



New Visio Professional better way Look who's using it.

See what it can

do for you





Focus, foresight, clarity all applied to something you can't see

NationsBank is saving a substantial amount of time by using Visio to map out and plan their data communications network. They're also using Visio's ActiveX capabilities and the company's intranet to share Visio drawings with network project personnel nationwide.

Your job is to make sense of the network, the database, the Internet—
all things you can't see. Which is why we've introduced Visio® Professional.

It allows you to visualize your information systems, think about them clearly and decide how to best integrate them into your business processes.

With Visio Professional you can easily create, store or exchange advanced network diagrams, process flow diagrams, entity relationship diagrams, software development layouts, web site maps, TQM diagrams and more.

Plus VBA® is built right into the software for added customization.

See for yourself. Call 1-800-24-VISIO ext. 95K or visit www.visio.com.

Visualize your business"



© 1997 Visio Corporation. Visio, the four-shapes logo, the Visio logo, and the Visiology your business logo are either registered trademarks or Visio Corporation in the United States and/or other countries.
Visios Reser for Applications (VRA) is a resistance of trademark of Microrofi Corporation. All other trademarks trade countries are used for identification only and see the received of their respective pages.

Madge software can eye both ATM and Ethernet

By Patrick Dryden

MADGE NETWORKS, INC. last week introduced a version of its monitoring software that can analyze both Ethernet and ATM traffic.

The software has the unique ability to view frames within Ethernet connections and cells within Asynchronous Transfer Mode (ATM) circuits.

A version due later this year also will handle Token Ring traffic.

Analysts said that can help users of Madge switches in two ways. First, it will let Madge users for the first time easily control and troubleshoot ATM usage.

It also will help ease their migration from current networks to a faster technology better suited to multimedia communications.

FEW ATM TOOLS

Few organizations have really embraced ATM networks, analysts say, partly because managers lack tools to analyze cellbased conversations switched at high speed across a network.

"Right now, we can only see some basic statistics for individual ATM circuits, but we really need to examine overall performance in order to adjust capacity," said Candy Rivelli, information systems coordinator for the city of Bettendorf, Iowa. Currently, 150 users at seven city offices rely on a Madge ATM network for voice, videoconferencing and applications that include transfer of files up to 80M bytes in size.

"We must see how these loads are balanced to ensure adequate capacity," Rivelli said.

Madge, in San Jose, Calif., next month will ship the double-duty version of its Switch Monitoring (Smon) software. Called SmonMaster, the tool is part of Madge's Montage management suite. It will cost \$11,500.

"It's absolutely vital for Madge users who want to use ATM for more than data," said Jim Metzler, director of consulting services at Strategic Networks Consulting, Inc. in Rockland, Mass.

Madge lacks ATM's "mind share and market share," Metzler noted, but its "cool Smon technology" complements an emerging standard for ATM monitoring.

Smon also has been proposed as an extension to the Remote Monitoring method for tracking network activity, he said. □

WAN view

CONTINUED FROM PAGE 51

Wheat First Butcher Singer in Richmond, Va.

Visual Networks, Inc. will start remedying that situation in June by adding broader reports — accessible via World Wide Web browsers — designed for information systems executives instead of technicians.

The brokerage and about 140 other organizations use the Visual UpTime WAN interface from Visual Networks to monitor traffic flow through individual framerelay circuits and other links.

The upcoming Executive Reporting Package should help profile the full impact of new applications, Internet access and added SNA traffic, Hall said.

VENDOR ISN'T ALONE

Other vendors are working on a broader vision of the network. Visual Networks in Rockville, Md., last week introduced a series of enhanced reporting options that will ship this year. ADC Kentrox in Portland, Ore., next week will announce plans to monitor frame-relay WAN performance through a partnership with Kaspia Systems, Inc. in Beaverton, Ore. Concord Communications, Inc. in Marlboro, Mass., recently launched a WAN version of its monitoring software.

Direct Web access to the new reports will eliminate the hassle of printing performance data for network planners and other officials, Hall said. But he said he will have to properly configure access controls to ensure that outsiders on the Internet won't be able to view details about the vital trading network.

Visual UpTime consists of a WAN interface unit for each site. The units contain agent software for analyzing protocols, packets and performance. Prices start at \$1,195 each — about \$400 more than a standard interface.

Each unit reports to a central console, which costs \$11,995, including the supporting Windows PC. The high-level report package with Web server costs \$9,995.

ADC Kentrox is catching up in monitoring capability. For the first time, users of its FrameVision WAN interfaces will be able to track the performance of frame-relay circuits.

ADC Kentrox will integrate Kaspia's Automated Network Monitoring System software with its hardware to enable real-time analysis from browsers. Kaspia's software starts at \$5,000 and requires a high-powered Windows NT workstation.

Similar WAN performance monitoring is possible without any vendor's special hardware. Concord Communications offers a software-only monitor called Network Health.

The Unix-based console costs \$6,000, and an add-on module for analyzing frame-relay performance costs \$3,000, plus \$32.50 per circuit.□

Now Visio puts

SAP within easy reach.

Visio* Business Modeler is an add-on to Visio products that gives you a comprehensive, stand-alone "business blueprint" for analyzing your organization and facilitating better communication during an SAP* R/3* system implementation.

Because Visio Business
Modeler doesn't require a
"live" SAP R/3 system to
function, it can help you
evaluate an R/3 installation
before purchase as well as
document your current
business practices.

By leveraging the ease-ofuse and affordability that Visio is known for, Visio Business Modeler helps eliminate obstacles to a streamlined SAP R/3 implementation.

Call

1-800-24-VISIO ext. Q28 or visit www.visio.com

Visualize your business"



c1997 Visio Corporation, Visio, the Visio Logo, and the Visualize your business logo are either registere trademarks or trademarks of Visio Corporation in the United States and/or other countries. SAP and R3 are registered trademarks of SAP AG. All other trademarks, trade names, or company names referenced herei are used for identification only and are the proporty of their researchie owners.

SOLUIII ONS

Get a firsthand look at the best and brightest in Microsoft Windows custom applications at the sixth annual Windows World Open!

See the 1997 Windows World Open finalists demonstrate their brilliant business solutions in booth W7043 at Windows World/COMDEX Spring 97 in Atlanta, June 2-5. These innovative applications use the Windows platform and leading-edge technology to solve business problems, increase profits, achieve higher customer satisfaction and more.

Final judging takes place on site. Be there when Microsoft CEO.
Bill Gates announces the contest winners on Tuesday, June 3, during
his keynote presentation at Windows World/COMDEX.

To find out more about the Windows World Open, visit the web site at http://www.wwopen.com or call 800-829-4143 or 206-443-3329.

THE-1997 WINDOWS WORLD OPEN FINALISTS

- Rusinage Intelligence Systems
- · The Associates
- · Cerveceria Polar
 - . John Deere Health Care
- Core Basiness Sys
- • BankBoston
- · Kmart Corporation
- Merrill Lynch
- Promus Hotel Corporation
 US Air Force Reserve/
 Air National Guard
- Customer Service7
 - California State
- Automobile Association

 Hewlett-Packard Company
- Lawson Products, Inc.

- Fundaven Information Access Sustain
- Buster Enterprises Inc.
- · Lawson Products, Inc.
- NASD Regulation, Inc.
- Process Control Systems
- Enterny
- . Laboratorio Analytica S A.
- Stepan Company
- Workflow Systems and
- Athans & Taylor
- Chartered Accountants
- EDS
- · Southern California Edison

Sponsored by:

Microsoft

COMPUTERWORLD

COMPEN

WALL

EWINDOWS WORLD

The Internet

Firewall poll online

ased on the World Wide Web the results of its 1997 firewall product survey. The "product matrix" features product details from 30 vendors and explanations of the strengths and weaknesses of various classes of firewalls. The data is available at www.gocsi.com/

NT firewall support

A new version of Ukiah Soft-ware, Inc.'s NetRoad FireWall supports Windows NT Server networks and Novell, Inc. Net-Ware. The addition of Windows NT Server support means Ukiah can provide a ne-stop security firewall ge for multiplatform, protocol networks. The NetRoad FireWall with NT support costs \$995 for 10 users. A package that supports an unlimited number of users costs \$10,995.

Outsourcer expands

Internet outsourcer USWeb Corp. last week announced it has acquired four subsidiaries that were operating on a fran-chise basis. That gives the company direct presences in New York, Washington, Phila-delphia, San Francisco, Milwaukee, Denver, St. Louis and Orange County, Calif.

The company serves as a central clearinghouse and grants franchises for Internet insultancies that operate as ident businesses under the USWeb name in 54 loin Santa Clara, Calif., also said it plans late this year to open consultancies in Japan and Southeast Asia.

Corporate spending on Internet commerce software

1996	\$22,4M	
1997	\$53.3M*	
1998	\$226.6M*	
1999	\$1.05B*	
*Projected Base: 50 Fortune 1,000 sites		

Briefs Web makes hospital 'net work

▶ Pilot-test site links disparate legacy data

By Thomas Hoffman

AFTER MERGING to stave off cost-slashing health maintenance organizations, many hospitals spend years and millions of dollars getting their clinical databases under one roof.

But a new partnership between Boston's Beth Israel and Deaconess hospitals is on the path to a low-cost cure for that malady. The two institutions. which merged last October to form CareGroup, have spent the past six months and less than \$50,000 creating CareWeb, a World Wide Web-based common medical record source.

board-approved. It currently provides read-only access to sample patient data (freya.bidmc.harvard. edu/careweb.htm).

HIGH HOPES

But CareGroup executives and end users are optimistic that the two institutions may soon share disparate legacv data in a secured environment.

'There's still a lot of work to be done, like proving that the technology itself is stable," said Dr. Charles Safran, director of informatics and advanced technology at Beth Israel. But CareWeb is still a pilot project the barriers aren't overwhelm-



"People told me this project wasn't possible"

Having easy access to background information on patients would smooth the admissions process, said Mary Alessi, an admissions clerk at Deaconess Glover Hospital in Needham. Mass. That information is currently stored in proprietary systems at separate facilities,

To ensure the confidentiality of patient data, the hospitals will change user passwords every 60 seconds. As such, Care Group's 5,500 end users will have to use hardware "tokens" Hospitals, page 60

she said

Firms: Open the store. lock the safe

By Mitch Wagner

WHEN Federal Express Corp. went live with its Internet commerce site, it almost gave away the keys to the kingdom.

Developers were testing a proposed new feature of the company's World Wide Web site (www.fedex.com) that would automatically locate the closest lockbox for customers who wanted to drop off packages for delivery.

The feature was designed to let users input their locations and automatically query an internal database of FedEx lockboxes to find the closest one.

"We were seeing a lot of strange numbers coming up with the address. We couldn't figure out what it was," said Paul King, a senior marketing specialist for electronic commerce at FedEx in Memphis. Then we realized - some of our staff were putting the combinations to the lockboxes in the database, which was OK at the time because nobody outside the company was supposed to see it. But that had to change when we were putting the information up on the Internet."

Despite the risks, FedEx and Open the store, page 60

Business on the Web is hitting the mainstream

▶ Technology, cost bring more companies online

By Mitch Wagner ATLANTA

THOSE ATTENDING Internet Commerce Expo here earlier this month said they have noted a sea change in user attitudes toward electronic commerce compared with last year.

Users at Internet trade shows last year were trying to figure out whether to get involved with Internet commerce. Now, they have made the commitment, although they still aren't sure what shape their electroniccommerce efforts will take.

"Internet commerce is coming down to the level where everyone can play," said Richard Kramer, manager of information systems at Want Ad Publications, Inc. in Sudbury, Mass.

Internet systems are becoming so prevalent - and sophisticated technology is becoming so inexpensive — most companies can afford to at least experiment with electronic commerce, Kra12-step process for building an E-commerce platform

1. Assess your needs

- 2. Look at the available products and what needs to be custom-
- 3. Set priorities
- 4. Develop a detailed product plan
- 5. Conduct joint application and
- Nize the user's experience
- 7. Develop a prototype
- 8. Yest for usability
- Nevise prototype based on testing results
- 10. Test for performance and
- Revise prototype based on testing results
- 12. Launch product

The boom in Internet commerce is mostly a matter of critical mass, users said. As more companies go online, their competitors, vendors and business partners see the need to go online as well.

Meanwhile, promotional efforts from America Online, Inc. and computer and telephone companies are luring ordinary people online, which makes the Internet more mainctroam

CROWD REACTION

"It's taking off, if for no other reason than herd mentality. Everyone is doing it," said Dan Dunay, director of the new technologies group at Maritz Performance Improvement Co., a human resources consultancy in Fenton, Mo.

But users cautioned that electronic-commerce advocates shouldn't feel overly heartened by the enthusiastic response from attendees at electroniccommerce trade shows.

"It's an insider situation here. The people on the show floor want it to happen, but the senior managers haven't come around," said Mark Rhoney, director of strategic marketing at United Parcel Service of America, Inc. in Atlanta.

He said senior managers tend Web business, page 60

"It's like having a lock on your door. There's always someone out there who can break locks. But still, you need to take the precautions."

-Ray Pasley Kansas City Power & Light

Open the store, but lock the safe

CONTINUED FROM PAGE 59

other companies are finding it essential to build links between back-office systems — mainly legacy databases — and the Internet. The links give customers and business partners access to information about their accounts and services.

"The more you can empower your customer, the better business relationship you can have with your customer," said Chris Pizey, webmaster at Universal Press Syndicate in Kansas City, Mo. "When it comes time to decide who they'll buy from or do business with, all that sort of thing goes into the mix. It helps make the sale easier."

Universal Press Syndicate is building a system to provide customer-service information on the Internet so its retail book distributors can check the status of shipments and accounts-receivable information.

Other companies also are making private information public to gain a competitive edge. Marriott International, Inc. in Bethesda, Md., provides access to its reservations system

to let customers reserve rooms and change frequent-traveler information.

Kansas City Power & Light Co. in Kansas City, Mo., lets customers access electrical-usage history information on a Unix database and is experimenting with online bill payment.

Sensible security measures can make exposing internal data on the Internet relatively safe.

Security is a major concern for those applications, but it isn't a reason to stay off-line. Sensible security measures can make exposing internal data on the Internet relatively safe, information systems managers said

Encryption and firewalls are only a starting point. Marriott and Kansas City Power & Light shelter legacy systems from the Internet by allowing access only at "mirror" sites — servers outside the firewall that contain duplicates of the data stored on internal sites.

"It's like having a lock on your door," said Ray Pasley, supervisor of network services at Kansas City Power & Light. "There's always someone out there who can break locks. But still, you need to take the precautions." Ultimately, the risk of being off-line outweighs the risk of being online, because customers are increasingly demanding online access to data and will take their business to companies that have a dynamic online presence, Pasley said.

Obstacles to putting internal collections of the data and the applications housing the data. Reservations and accounting systems managers, for example, need to be convinced that it is good for the company—and good for them—to allow Internet access to their systems.

"It's their jobs to be gatekeepers, and they have legitimate concerns," said Bill Schallenberg, Web publisher at Marriott.

Internet advocates need to demonstrate that internal corporate data can be updated over the Internet in a safe, reliable fashion, and faster and easier than by other means.

How do you do that? "Meetings," Schallenberg said. "Lots and lots of meetings." □

Hospitals use Web to link databases cheaply

CONTINUED FROM PAGE 59

to access the system.

CareWeb already
has vaulted other hurdles. Many of Beth Israel's information

dles. Many of Beth Israel's information systems staffers, for example, didn't think its legacy data could be Web-enabled because 28,000 of the hospital's computer

programs were written in Mumps, a closed development language and database, said Dr. John Halamka, a postdoctoral fellow at Beth Israel.

NO MORE MUMPS

Fortunately for Halamka, Beth Israel's Center for Clinical Computing was migrating from Mumps-based software to the Open M database from Cambridge, Mass.-based InterSystems Corp. Open M takes an ANSI-standard version of Mumps and ports it to a standard operating system such as Unix or Windows NT.

Using InterSystems' Visual M development tools and Microsoft Corp.'s Visual Basic to build the Web site, Halamka could present a single view of data in Beth Israel's Open M and Deaconess' Sybase, Inc. systems by late December.

That feat made his mentor, Safran, proud — and a little bit

Beth Israel Hospital has more than 1 million computerized patient records, and Deaconess Hospital has more than 100,000 patient records.

"I bet our colleagues at other hospitals one dollar that we would succeed at bringing this up by the end of 1996," said Safran, a physician who also teaches at Harvard Medical School. "I won the bet."

HELP FROM NEW ZEALAND

But not without a little luck. The underlying communications standards that hospitals rely on to share data is called HL7 EDI for Healthcare. It could have taken Halamka months to create a component that could disassemble HL7 messages from the two hospital environments.

Instead, he found an HL7specific ActiveX messaging system called Symphonia — from a tiny New Zealand-based outfit called Orion (www.orion.co.nz) — that could do it for him.

"I'm a technology opportunist," Halamka said. "If [a vendor] has a component worth using, drop it in."□

NEW PRODUCTS

VIDEONICS, INC. has announced Video ToolKit 3.0, a desktop video editing package that was designed for use on the Internet.

According to the Campbell, Calif., company, the tool kit lets a user link and control up to seven source and post-production devices through one computer serial port. Users can create Hypertext Markup Language documents for the World Wide Web so users can send video story-boards and other work via Internet sites without having to reformat data.

The tool kit costs \$279. Videonics (408) 866-8300 www.videonics.com

ONDISPLAY has announced CenterStage, a software package that helps users access World Wide Web sites and extract and categorize data for integration with business applications. According to the San Ramon, Calif., company, the software uses OnDisplay's PageAgent technology to transform Hypertext Markup Language into more useful information that corporations can integrate and share with their partners, customers and suppliers.

Pricing starts at \$295 for a desktop version and \$9,995 for a Windows NT server version

OnDisplay (510) 355-3200 www.ondisplay.com

PRECEPT SOFTWARE, INC. has announced Stream Watch software for determining audience demographics on intranets and the Internet.

According to the Palo Alto, Calif., company, the software helps business and network managers uncover usage patterns on audio and video applications. The program is Windows-based and tracks multicasted multimedia data streams that use the Real-time Transport Protocol standard. StreamWatch costs \$995.

Precept Software (415) 845-5200 www.precept.com

FRACTAL DESIGN CORP. has announced Fractal Design Poser 2 for Windows, three-dimensional modeling and rendering software that creates human figures for use in animation. The animations can be saved as Apple Computer, Inc. QuickTime movies for use on the World Wide Wah

According to the Scotts Valley, Calif., company, the upgrade adds animation and the ability to add props and substitute 3-D models for body narts.

Fractal Design Poser 2 for Windows costs \$249. Fractal Design

Fractal Design (800) 846-0111 www.fractal.com

Business on the Web is hitting the mainstream

CONTINUED FROM PAGE 59

to be 35 to 55 years old, and only 40% of that population even uses computers.

Much of the driving force behind electronic commerce comes from the consumer sector, said users at the expo.

"Contrary to popular opinion, consumers are accepting the Internet faster than business," said William S. Finklestein, vice president and manager of the direct distribution group at Wells Fargo & Co. in San Francisco.

His view runs contrary to the conventional wisdom from industry analysts. For example, Framingham, Mass.-based International Data Corp. recently conducted a survey that found that two-thirds of respondents didn't plan to buy goods online and that three-quarters of respondents didn't plan to buy services online.

And that poll was conducted online, where people are, presumably, more Internetfriendly.

But Finklestein said some consumers may be more quick to buy online than some business users, if only because they can experiment online without having to first convince a senior management team that it is a good idea.



Technology

Client/Serve

Windows TM based

Internet-enabled Applications

Product Features

Fully embedded Self-Service Applications

- Employee
- Manage

Workflow

Integrated Decision Support System

Comprehensive HR Functions

- Training and Development
- Compensation
 Management
- Position₂
 Management
- Career
 Development
 and
 Succession

Payroll Options

Best of Breed Integrated Solutions

Implementation and Service She has a hyphenated surname, and a telecommuting mom. But to our HR system, she's just another bundle of joy.

Updating complicated personal liles is enough to make any HR manager craftly. Which is why your company should consider a change to a CSS HRizon™ System from ADP

CSS HRizon offers the only HRMS with fully embedded Employee Self-Service and Manager Self-Service features, both of which are Internetenabled. Which means now managers and employees can access and update HR information whether they re working at the office at home, or son the road! In addition, CSS HRizon provides a wide range of other solutions. From rapid implementation to IT outsourcing ADP has a system that's designed to fit the way you do business.

The advantages of choosing a CSS. HRizon System don't end there. Because we'll provide a support team to guide you from current system analysis to new system implementation to ongoing maintenance.

No wonder over 5:000 com panies rely on ADP for HR solutions. Solutions that seamlessly integrate your HR, benefits, and payroll information.

- To find out how CSS HRIZON can bring newfound joy to your HR department, visit us at adp.com or call for a free demo on CD-ROM

1 800 CALL ADP ext. 400

www.adp.com

HUMAN RESOURCES

BENEFITS

PAYROLL

Focus on what matters



What do you call it when industry leaders give everyone access to killer apps and ideas that map the future of digital document production?

Call it DocuWorld.

There has never been anything like DocuWorld. It begins May 13 and 14 in cities around the world. It's a live and virtual event where 12,000 people will see killer applications, new products, emerging technologies and end-to-end solutions from Xerox and other leaders of the digital document revolution. It's the latest word in efficient and effective document

production. DocuWorld is also a continuing community on the Internet. It's where customers and companies can explore new solutions together. Discover new opportunities. And map out the frontiers of digital document production. If you want to register for DocuWorld, just visit our Web site at: www.docuworld.com. Or give us a call at: 1-888-DocuWorld.

THE DOCUMENT COMPANY

XEBOX - The Document Company, - DocuVeriel and the digital X are trademarks of XEROX CORPORATION. All company names and logos are trademarks of the operative owners. 36 USC 380.

Corporate Strategies

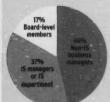
The Securities Industry Ass ciation, a New York-base oup of more than 750 securimittee to coordinate systems implementation changes for the year 2000 problem. Arthur Thomas, senior vice president and director of global operations services at Merrill Lynch & Co. in New York, will chair the committee.

IRS may push E-filing
A panel studying the Internal ue Service may recom mend that all federal tax returns be filed electronically in 10 years. The National Commission on Restructuring the IRS said last week it may include an electronic filing provi sion in its July report to Con-gress. Electronic filing reduces data-entry errors from about 20% to less than 1% and cuts processing costs, the commis-sion said.

Mac group targets iS

The revamped New York MacUsers' Group (NYMUG) recently unveiled new membership services targeted at large sites and businesses critical roles. The new information systems special interest groups and Corporate Membership Services are part of a new direction announced in December when NYMUG teamed up with Charles River puters, a New York-based Macintosh and PC consultant. NYMUG is the third-largest Macintosh user group in the

Who initiates IS projects?



Base: 100 senior managers at large

· Client/server upgrade

Unifying a legacy mix

By Randy Weston

AT STEEL and plastics maker Worthington Industries, Inc., an upgrade in financial software systems signals an effort to improve cash flow. But the three-year project also means overcoming the challenge of moving from a weed field of homegrown mainframe programs to a single client/server application.

The Columbus, Ohio-based company is in the midst of a migration from homegrown, decentralized mainframe systems that run independently at 22 locations to a centralized client/

that runs on a single Unix-based HP 9000 server at headquarters. The key software is Smart-Stream from Geac Computer Corp. in Atlanta.

When the project is complete, controllers at the various locations will be able to feed financial information into the central server while still being able to analyze the information locally.

"One of our primary objectives was to create [monthly accounting] closing information on demand," said project leader John Krulcik. "We were used to taking five to six days to close Client/server, page 66



Wants to reduce time for closing books from six days

CD-ROMs and Web publishing cut costs. speed access

By Lisa Picarille

HARDWARE WHOLESALERS, Inc. has 3,500 member retailers in the U.S. that need to receive updated pricing and information on 65,000 products and supplies. The Fort Wayne, Ind., hardware and building-materials supplier distributed microfiche to its retailers with product data to guide their supply orders - until last year.

That was when Hardware Wholesalers began distributing its information on CD-ROMs for PC users.

That move to publish information electronically - whether as a CD-ROM, an intranet application shared with employees and business partners or a public World Wide Web site - is a typical strategy to cut costs and speed information delivery. No matter what the industry, every business ultimately runs on information, so every company's second business is publishing.

According to a recent study by consulting firm Deloitte & Touche, corporations spend 12% to 15% of their revenue on publishing-related activities for both internal and external delivery.

Businesses use electronic publishing to deliver training CD-ROMs, page 66

IS firm looks beyond tech skills

AS A SYSTEMS integrator, Align Solutions Corp. seeks IS professionals who are fluent in client/server applications and the Internet. But along with the technologists, the Houston-based startup is looking for people who know about writing, graphic arts, public relations and adver-

The idea is to cross-



SourceNet customers can make purchases using an Align Solutions-designed GUI

pollinate the various skill sets, its customers — view as critical which Align's founders — and to producing multimedia applito customers. Those include interactive kiosks, World Wide Web-based electronic catalogs and multimedia sales presentations.

Align's customers said this hiring strategy gives them access to skills that will help them reach broad audiences.

What technically brilliant people can generate is something that other technically brilliant people can use and un-Technical skills, page 68

Incentive-based contracts move into government work

By Sharon Machlis

THE U.S. SENATE this month received a refund of more than \$250,000 from a computer services firm - even though the vendor had fulfilled all its contract provisions and Senate officials say they are satisfied with the service

That's because the contract was a "gain-share" pact, where savings from increased productivity, better tools and the like were split about evenly between the Senate and its vendor, Wang/I-NET Government Services in McLean, Va.

"I am overjoyed to hear about this," said Steven Kelman, administrator of the Office of Federal Procurement Policy in Washington and a proponent of the concept.

Such contracts have been slow to catch on in the public

SENATE 'GAIN-SHARING' CONTRACT BENEFITS

- Paperwork cut from more than 250 invoices per year to 12 invoices
- Help-desk performance goals instituted, including two-hour target for fixing network problems
- \$230,000 refund for improved productivity

sector - particularly at the federal level - because of legal questions and a long history with more conventional feebased deals. "In the past six months, we've begun to see a concerted push to familiarize [information technology] buyers

in the federal government with gain-sharing," Kelman said. He said he hopes such agreements will become commonplace within five years.

Some experts caution that although these pacts hold the Contracts, page 68 with data located behind a var different operating systems—Note of the key thing UNIX, MVS. The key thing trying to do is pool that data trying to do is pool that data from all sources and create tion out of it. We researched narket a great deal to help

Phil Orton, Director of Centralized Operations Entered

rety or we're together informaus deve

Consolidating information for business results is nothing more than wishful thinking without EMC Enterprise Storage.™ With EMC at the center of the IT enterprise, business leaders now have the tools they need to leverage all of their information into a powerful competitive advantage. Finally, vast amounts of information can be managed, stored, protected, and rapidly shared simultaneously across all platforms - mainframe,

Not Without open systems, NT, AS/400, you name EMC Enterprise Storage They Won't.

it. EMC Enterprise Storage. For companies that want to grow as quickly as their information. To learn more,

visit our Web site at www.emc.com, or call 1-800-424-EMC2, ext. 382.

CD-ROMs and Web publishing cut costs

CONTINUED FROM PAGE 63

manuals, health and benefits booklets, product lists, corporate policies and price lists.

At Hardware Wholesalers, the change from microfiche to CD-ROM has been well-received — both inside and with business partners

"Now with the CD-ROM, users can search, print information and even order products. Having an updated catalog is a very important element because we are in the wholesale environment," said Kay Williams, publications manager at Hardware Wholesalers.

Williams added that the CD-ROMs include instructional videos, information on vendors and special ordering information. "If we had that amount of information available on paper or microfiche, our costs would quadruple," Williams said.

However, until all of Hardware Wholesalers' customers start to use the CD-ROM catalog, the company still has to produce a microfiche version for two more years. Williams said eliminating it will save \$250,000 per year.

Dataware Technologies, Inc., a developer of electronic publishing software in Cambridge, Mass., estimates it costs \$3,50 to deliver 1M byte of information on paper vs. about a quarter of a cent on a CD-ROM. There are an estimated 117 million computers equipped with CD-ROMs in the U.S.

A CD-ROM, which holds the equivalent of 200,000 pages of paper, costs between 70 cents and \$1.20 to produce. The cost of publishing on paper ranges from 1 cent to 4 cents per page.

Although electronic publishing often reduces back-end costs, there are upfront expenses associated with publishing online, such as special hardware and software, hiring a person with online programming skills to post information and maintenance of servers.

But one user said the benefits and eventual savings far outweigh initial costs. This user publishes documents both on an intranet and a Web site.

"We are required by law to publish reams of information about the handling and hazardous nature of chemicals," said a systems team leader at a large East Coast chemical company, who asked not to be named.

ELECTRONIC PUBLISHING BENEFITS

- Provides up-to-date information that is instantly accessible
- Lowers paper costs
- Eases communication with customers and business partners

The company, which ships more than 1 million pages to customers per year, spent \$200,000 in 1995 to ship paper copies all over the country. But that figure will be cut to \$100,000 this year, thanks to electronic publishing. At the same time, the department responsible for sending out the reports was reduced from seven people to two.

Client/server unifies a legacy mix

CONTINUED FROM PAGE 63

the books." Krulcik said he wants to cut that to one day with the new system. But he acknowledged it will take time to get users up to speed.

The \$2 billion Worthington already has eight sites online, and it will buy the remaining 14 at a rate of about one per month for the next year. Each site handles about \$70 million of Worthington's cash flow.

HARD AT WORK

Krulcik, a certified public accountant and controller by trade, was joined by six other full-time workers for the project. Most were business department people who would eventually return to their jobs as end users of the new software system. The information systems department was on standby to help with the technical aspects of software implementation and hardware configuration.

But Krulcik said he hit a snag when three key members of his team were promoted out of the project — almost all at the same time. It set the three-year project back about four months while his team's new recruits received the needed training.

"One thing I would have changed is to have a better contingency plan," he said. "I would have made sure from the beginning that the staff would be left in place for the duration."

The setback cost a few thousand dollars. For the 120 eventual users of the system, the project is estimated to cost about \$300 per user, including software licensing with an extended 10-year maintenance contract from Geac. Original projections were about \$275 per user.

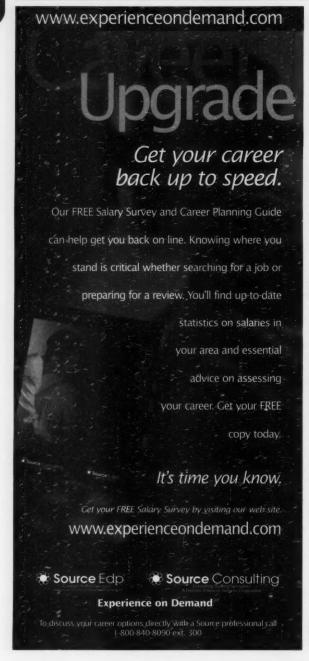
Worthington also lost time combing through years of piecemeal applications and custom code on the mainframes as well as reconciling extremely inefficient systems with the new system.

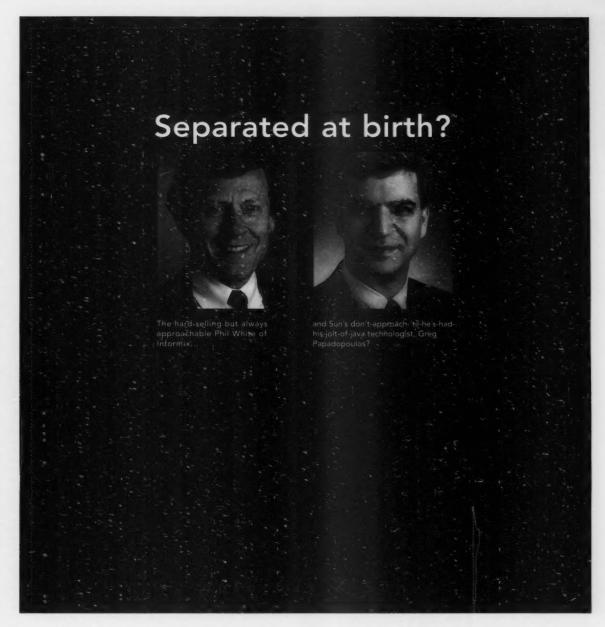
For example, James Lane, an Ernst & Young consultant who worked with Worthington on the project, said it took 1,000 hours to weed through a vendor master file on the decentralized mainframe system because of duplicate entries.

"It had 113 separate entries for AT&T alone because different people would enter it as 'A T T' or 'ATT' or 'A T and T,'" Lane said.

Lane said such findings are common in companies whose technology has grown up separately at individual sites. Reconciling such systems is often a large consumer of time on technology-migration projects.

But so far, the time spent is paying off. With just a handful of sites online, Worthington is seeing controllers do weekly "soft closes" on its accounts.





Sun and Informix. We've been together so many years, you'd swear we were related. In fact, thousands of companies have purchased Informix products on Sun's systems. And we've linked our engineering, service and support teams to deliver leading performance and customer satisfaction.

And now that Informix has adopted Java^w across its entire product line, you'll be able to manage and use information in new and innovative ways. Just another example of how we're working together to offer your business true mission-critical solutions. Not just promises. But then that's what true alliances are all about. To find out more, contact us at www.sun.com/sepcw or www.informix.com. THE NETWORK IS THE COMPUTER[®]





Incentive contracts move into government

CONTINUED FROM PAGE 63.

promise of cost savings, they can backfire if government contracting officials aren't savvy enough to negotiate them properly. The question: Is a "refund" a good deal, or was the government simply paying too much in the first place — and not demanding enough from its vendors?

In addition, it could create a public uproar if a company that does business with the government received a large rebate payment, even though the company bore the risk of slender profits if results had gone the other way, said Robert Dornan, senior vice president at Federal Sources, Inc. in McLean.

For now, federal officials are trying to ensure that appropriation laws for the executive branch explicitly allow "profit-sharing" contracts. (The Senate is covered under different legislation.) Some federal chief information officers have been searching for possible pilot pro-

grams. The Department of Energy, for example, has worked on a gain-share contract about to hit the streets for telecommunications integration, according to CIO Spain W. Hall Jr.

The Senate contract provides installation and support services, including staffing a help desk that serves offices in Washington and all 50 states. About 250 LANs and 8,000 desktop computers are covered. The contract, initially issued more than four years ago but recently revised, streamlined paperwork and instituted specific performance targets such as LANs being brought back up within two hours and a four-hour response to problems with a Washington-based computer. Profits above those specified in the pact were split between Wang and the Senate.

The idea was to bring the contract in line with what an innovative Fortune 100 firm might use, said Richard Zelkowiz, general counsel to the Senate's Sergeant at Arms administrative branch. For the federal government, he said, "We think this is an innovative approach."

IS looks beyond technical skills

CONTINUED FROM PAGE 63

derstand. But that's not your average population," said Walter Rogers, one of Align's customers. Rogers is president of CertiSource, Inc., also in Houston. Starting next month, CertiSource will offer a Web-based referral service for companies that seek certified software technicians.

Align aims to fill a need for a new breed of hybrid professionals — people who have a combination of technical and creative skills, can conceive innovative advertising and marketing ideas, and can help develop the information systems to bring them to life.

Rogers, for example, wanted an integrator to develop a Web-based electronic storefront for his new enterprise.

"A lot of the Web page has to do with marketing and selling, so we needed someone to take the concept, create a corporate identity for us and handle the whole thing," Rogers said. Another customer, Houston-based SourceNet, which outsources corporate purchasing and accounts payable functions, needed an electronic catalog and order form that its clients could use to have office running and other group

buy office supplies and other goods.

Both companies reviewed proposals from traditional systems integrators. But ultimately they hired Align, whose niche business is developing electronic commerce and document management applications whose primary users are non-technical consumers.

FOUNDING FATHERS

For Your

INFORMATION.

It's Open M.

Align was founded in October by a small group of Houston-based design and marketing experts and several defectors from Andersen Consulting, Perot Systems Corp. and BSG Alliance/IT.

"We looked at the market and saw people building systems that go outside a company's walls, and we saw that there's a different set of skills you need to do that," said Align Chairman Richard Scruggs, a former Perot executive.

"From day one, we decided to create a company that was a merger of technical and creative disciplines," he said.

Today, several of Align's 26 staffers are graphic designers or systems developers who are self-taught in multimedia skills. A few others are recent graduates of new digital design programs, such as the one at the University of Houston.

Other new employees include client/ server specialists and database experts who, above all else, must be flexible and team-oriented, Scruggs said.

"We're not looking for any Lone Rangers, because it's a mix of skills that's required for these applications," he explained. Scruggs said Align wants its client/server staff to understand how to communicate using multimedia and the Web, along with "people who know how to tell a story."

The idea is for people from both disciplines to learn from each other.

"I imagine if we fast-forward a year, we will have cross-pollinated enough that there will be some people who can wear multiple hats," Scruggs said. □

TradeWave sold

CyberGuard Corp. in Fort Lauderdale, Fla., has acquired TradeWave Corp. in Austin, Texas, in an effort to move into electronic commerce. CyberGuard sells its own firewall product and various third-party offerings. TradeWave, previously part of SunRiver Corp., provides digital certificate products for the electric utility industry. Its products are widely used by companies on that industry's nationwide Open Access Same-time Information System network. Terms of the deal weren't announced.

Texaco trading system

Texaco, Inc. has awarded MCI Systemhouse a \$5.1 million contract to implement and support a client/serverbased commodities trading system. White Plains, N.Y.-based Texaco plans to use the data-tracking system to monitor pricing and other trading logistics for the crude oil and refined products it buys and sells around the world.

Bank outsources HR

Firstar Corp., a Milwaukee-based bank with \$19 billion in assets, has signed an outsourcing agreement with Fiserv, Inc. in Brookfield, Wis., to run its human resources, payroll and benefits processing services. Terms of the agreement weren't disclosed.

Ex-SAP exec in launch

Guenther Moeckesch, former development director of logistics at SAP AG, is launching a new company to develop software for the supply-chain and production-management markets. Called PDS Technologies LLC, the new Cambridge, Mass.-based company is a joint venture between Moeckesch's company Camelot IS-2 International LLC and Gensym Corp., both also located in Cambridge.

Camelot IS-2 is a consulting service with emphasis on the manufacturing industry and plant logistics. Gensym makes software for the industrial, scientific, commercial and government sectors. With PDS, the companies are hoping to develop an application system for companies to execute supplychain and production strategies. The delivery schedule for the new company's software hasn't been set.

Europeans fear decline

Europe's information and communication technology industry requires urgent attention to push it to the forefront of the global market, according to a report the European Commission released last week.

Since 1980, Europe's share of the global IT market has dropped from 35% to 28%. The commission report identifies high European labor costs as a handicap to IT growth but fails to recommend solutions to that problem.

Which
database
is the
lifeblood
of 15 of the
top 16 US
hospitals?*

*Based on U.S. News and World Report,

.....

2n

For more information, check our web site at www.intersys.com/cw or call 617.621.0600, Dept. CM



Sun and PeopleSoft. Together we provide solutions that scale across the entire enterprise. Solutions that deliver the performance and reliability modern business demands. Jointly, we are committed to delivering universal access to business information worldwide,

whether it be through an intranet, extranet, or on the Internet. All with a level of quality that's winning over customers around the globe, from recently merged healthcare organizations to the largest retailers in the world. In short, it's the sort of alliance that gives you not just technology, but superior answers to business challenges. To find out more about what we can do for your organization, contact Sun at www.sun.com/sepcw or PeopleSoft at www.peoplesoft.com or 888-PSFT-APPS. **THE NETWORK IS THE COMPUTER**.





PERFORMANCE EVERYILING

for data warehouse success

RED BRICK WAREHOUSE 5.0 IS THE WORLD'S fastest and most scalable relational database

for data warehousing, including data marts, OLAP and data mining.

Register now for the

"Performance is Everything"

seminar in your area.

1 800 939 1845

www.redbrick.com

Performance is Even It in the archousing

The Universal, generic, one-size-fits-all

RDBMS" approach is

wrong for data warehous-

Red Brick Warehouse

s the only RDBMS

designed specifically for

data warehousing. With Red Brick, you get a data

warehouse solution that performs ten times faster

for half the cost, deployed in one-third the time.

Red Brick is the industry's fastest growing

database company and the leading provider of

ingli-performance RDBMS products for data ware-

housing. Our customers

are successful because our

products and service

enable more users to

analyze more data and

make better decisions faster.

To learn more, attend the Performance is

Everything" seminar in your area. Register now:

1 800 939 1845 or www.redbrick.com.



Data Warehousing

Merge/Purge 5.0

when matching customer data and identifying customer rele-tionships. With business-tobusiness parsing, Merge, Purge so can identify and dardize name, title and company name in all field for-mats. Pricing for the La Crosse. Wis., company's batch appli-cation, library product and graphical user interface rangs from \$17,000 to \$150,000.

More data mining

luct line by teaming u thSoft's data mining prodcts are based on an o

ABOUT AVERAGE

Evolutionary	
Technologies	В
International	
	-

informatica

Carleton

Prism

Software AG

Briefs Scaling up your warehouse

▶ When SMP maxes out, several choices step in

By Jaikumar Vijayan

SYMMETRICAL multiprocessors. most of which accommodate between two and 32 CPUs, can meet the huge demand for growth of a data warehouse. But try to scale beyond that - and many users need to - and symmetrical multiprocessing (SMP) performance gains become less dramatic and more costly.

Alternatives for higher performance and scalability include Non-Uniform Memory Access (NUMA) architectures, massively parallel processor (MPP) systems and clustering.

"What you need for a good, fast data warehouse machine is literally infinite processing power, infinite I/O capability and infinite memory," said Jonathan Eunice, president of Illuminata, Inc. in Nashua, N.H.

That might not be practical. But the choices available have advantages and disadvantages.

SMP servers let users tie multiple processors together and har-Scaling up, page 74

TECHNOLOGY	PROS	CONS		
SMP	Data warehouse performance increases can be achieved by adding CPUs.	Operating system must be architected for multiprocessing.		
	Applications don't have to be specifically architected to run in this environment.	Memory bus bottleneck: Too many CPUs slow performance.		
Clustering	Increased data warehouse per- formance with each node on a shared database. Fall-over capability for high availability.	Systems administration com- plexity grows with each node added. Database must be archi- tected for shared clustering.		
NUMA	Data warehouse performance increases can be achieved through a range of CPUs.	Operating system must be architected for NUMA.		
	Application will run unaftered in this environment (but will scale better if multithreaded and tuned to the architecture).	Largely untested in commercial environments.		
MPP	Steep performance increases through very high node expansion.	Operating system, utilities, tools and applications must be architected for MPP.		
	Single system view of all shared nodes.	Very expensive.		

Industry divided over vendor-backed specs

By Thomas Hoffman

INDUSTRY-STANDARD benchmarks used to be brushed aside as transparent attempts by vendors to showcase system performance by optimizing their hardware and software to run at peak performance using artificial data.

But in data warehousing circles, benchmarking has become a rather contentious issue lately. Some industry gurus believe Transaction Processing Performance Council Benchmark D (TPC-D) should be extended from database querying to data warehousing. Meanwhile, Red Brick Systems, Inc. in Los

own specifications specifically for data warehousing, data marts and online analytical processing (OLAP). But, more important, do information systems executives even care?



Well, yes and no, depending on whom you ask. Benchmarks "can be skewed to mean anything you want them to mean," said Ken DeWitt, vice president of credit information systems at Sears, Roebuck and Co. in Hoffman Estates, Ill.

The TPC-D results "are stratospheric," said Wayne Eckerson, director of the business intelligence and data warehouse service at Patricia Seybold Group in Boston. The results that vendors attain using TPC-D "are nowhere near what users

Benchmarks "can be skewed to mean anything you want them to mean." - Ken DeWitt, Sears

will achieve." Eckerson said. That's because vendor benchmarking is done "in a highly controlled laboratory environment" in which vendors can "tweak" their systems to run at peak speeds based on the nature of the queries, he said.

Sears devised its own realworld "benchmarking kit" when it went shopping for a customer information data ware house last year, DeWitt said. Vendors were asked to run their systems against a set of queries that Sears developed. Questions were representative of those that Sears expected to pose against a data warehouse, such as "Who are those customers that shopped with Sears automotive last year that don't have any current credit-card activity and live in the Midwest?'

Even though it took a few months for Sears to develop the benchmarking kit, DeWitt said

Benchmarking, page 74

Web Enabled SAS Software Data Warehouse for [8] 1840 Decision

Institute.

Successful

Making.

FREE for a Limited Time...A CD ROM Preview of

The Top New Data Warehousing Software When 200,000 IS managers were asked to

DAVAMANION
-PRODUCT
OF THE
YEAR 1996

Product

As the only end-to-end solution for rapid data warehousing, SAS software delivers everything you need to manage, organize, and exploit your business data. The tools you use

to build a data warehouse are the same ones used to maintain it... run it...and change it. And what's more, everything's scalable. Jump right into enterprise-wide information delivery applications...or start small and build on your success.

SAS software doesn't consume overhead for database features you don't need. And once you have data in the warehouse, you'll find everything you need for data query and reporting, OLAP/multi-dimensional analysis, data mining, database marketing, data visualization, and much more. It's never been easier to access your data...or to arrive at informed decisions by turning raw data into real information.

choose the top software for data warehousing,

their answer had a familiar ring:

SAS® software from SAS Institute.



SAS Institute

Software for Successful Decision Making

Phone 919.677.8200 Fax 919.677.4444 In Canada 1.800.363.8397

You can also request your free CD ROM, and learn more about SAS seminars in your area, by visiting us on the World Wide Web at http://www.sas.com/

E-mail: cw@sas.com

Scaling up warehouses

CONTINUED FROM PAGE 71

ness their combined power in a relatively inexpensive and painless manner. Users can start small and scale up quickly by simply adding more processors.

Users can run multiple applications in the same box using the different processors, all of which share a memory pool. And users can add processors without having to tweak either the application or the database.

The biggest bottleneck is the memory bus bandwidth. As the CPU count increases, so does the amount of traffic on the bus. This eventually causes system throughput to decrease dramatically, analysts said.

"It is like a freeway. You put a certain number of cars on the freeway and everything works fine ..., but you start having too many cars, and everything starts breaking down pretty fast," said Ken Rudin, president of Emergent Corp., a data warehousing consultancy in San Mateo, Calif.

CLUSTERING

One way to get past the memory bus bottleneck is to cluster systems together to increase performance or availability.

For instance, by tying together two 16-processor SMP servers, or "nodes," users can build one 32-CPU configuration server and significantly increase performance. And this is cheaper than building one large 32-CPU system, observers said.

Clustering can be expanded so the total number of CPUs far exceeds the CPU limit on SMP boxes. Digital Equipment Corp. for years has been offering OpenVMS clusters that can tie together up to 96 nodes — each of which can be an SMP system.

In theory, at least, users can get significant performance gains with each additional node. But each node has its own memory pool and system bus, which means programming has to be done to coordinate the communication of information and sharing of data across the various nodes in the cluster.

Thus, performance improvements aren't linear, and the bandwidth of the interconnect between the nodes themselves is often too low to sustain high-performance gains. Some vendors — such as Digital with ts Memory Channel interconnect and Tandem Computers, Inc. with its ServerNet technology — offer specialized interconnect technology to over

come this bottleneck.

But for the most part, observers said users rely on clustering methods more for high-availability purposes than for performance scaling. For instance, two or more nodes can be tied together in one cluster so that if one node fails, another node takes over automatically. That guarantees high availability of the hardware and applications.

Major vendors SMP · Digital • Siemens Pyramid . NCR · IBM · Hewlett-Packard Sun Microsystems Clustering • Digital • Pyramid . HP Sequent . Sun · IBM NUMA • Sequent • Data General MPP · Pyramid · NCR · IBM • Tandem

AMUMA

The NUMA approach is a sort of hybrid between SMP and clustering. NUMA arranges multiple processors in a server in small groups of processors. For example, a 16-processor server can be arranged into a cluster of four nodes with four processors each.

That technique lets users tie together more processors in one enclosure than SMP does. Sequent Computer Systems, Inc.'s NUMA servers, for instance, can support up to 252 Intel processors in one box.

"NUMA is basically making it easier and a lot cheaper to build really large SMP boxes," Eunice said.

As with SMP, users don't have to tweak applications or databases each time additional processors are added.

"We wanted to increase scalability while staying with the simplicity of the SMP model. NUMA allowed us to do that,"

said Larry McAferty, vice president and chief information officer at Source Informatics, a provider of health care information services in Phoenix. The company runs a 1T-byte data warehouse on a Sequent NUMA system.

NUMA avoids the memory bus bottleneck issue in SMP by essentially breaking the bus into several smaller buses. The processors within each node in a NUMA server communicate with one another using those smaller SMP buses. And each of the nodes communicates with the others using fast interconnect technologies.

"The advantage of NUMA is that it doesn't force people into a new programming model. You can take an SMP application and put it on NUMA, and it will run," said Kevin Libert, director of marketing at NCR Corp.

The drawback is that NUMA isn't as mature as SMP. And a lot of its success depends on how quickly and easily each of the nodes in the system can communicate and share data.

"There is a concern that we are pushing the technology envelope a little bit," McAferty

МРР

For near-linear performance gains, observers said massively parallel systems offer the best bet. MPP is significantly more expensive — some systems start at more than \$500,000, compared with about \$240,000 for an entry-level Sequent NUMA-Q 2000 — and more complex to manage than the other architectures. But it gives users virtually unlimited node expansion and a single system view to the application and users.

MPP gets past the interconnect and bus bandwidth bottlenecks of some other architectures through brute force, using very fast switching and scalable interconnect technology.

In an MPP configuration, hundreds, if not thousands, of processors can be tied together. Each has its own memory and bus and is capable of handling its own tasks and communicating with the others via highly specialized interconnects and switches.

But the applications and the database have to be tweaked extensively to run optimally on MPP systems, observers warned. For instance, the applications themselves often have to be "parallelized" so specific tasks are allotted to specific processors or sets of processors based on computing requirements. I

Benchmarking

CONTINUED FROM PAGE 71

the effort was well worth it. "If we hadn't, we couldn't have appropriately sized the platform, and we wouldn't have known how many nodes to purchase," he said.

In December, Sears began loading a 2.5T-byte Informix Software, Inc. SPS parallel relational database management system running on a 67-node IBM SP2 machine.

OBJECTION

Red Brick Systems recently slammed the TPC-D as "irrelevant" because TPC-D includes online transaction processing criteria that don't represent the query and load performance of relational databases used for data warehousing, including data marts, data mining and OLAP. TPC-D is backed by online transaction processor (OLTP) relational database management system vendors such

a footwear retailer in Stamford, Conn., said he thinks it would have been helpful to use a standard benchmarking process to compare the "like attributes" of the Oracle and Red Brick environments it evaluated 18 months ago. But the loading criteria for an OLTP engine such as Oracle is different from a relational OLAP system such as Red Brick, which does automatic data conversion and referential integrity. On Oracle, data loading "is more of a two-step process where you load the data in raw form" and then do the referential integrity checks, Alvarez

Using TPC-D guidelines, Oracle can claim that it can load data faster. "But that's a raw data load which doesn't include a referential data check," said Alvarez, whose company ended up selecting Red Brick last year.

Some people, such as Charles
Griffith at Bank-

America Corp., see merit in using the TPC-D benchmarks. The San Francisco bank has been using its own benchmarking kit to measure "the vola-

tility of our own ad hoc environment," said Griffith, a senior vice president and general manager of corporate MIS at the bank. BankAmerica runs a 1.8Tbyte NCR Teradata engine on (massively parallel processor) NCR 3600 and NCR 5100 Unix

But because BankAmerica's data warehouse is growing at a 40% annual clip, the bank needs to upgrade the hardware once per year. This year, BankAmerica intends to "reconcile" the TPC-D benchmark with its own testing criteria to measure how the systems perform with a mix of casual and "power" users accessing the data concurrently, Griffith said. "We haven't quite noodled how beneficial [TPC-D] will be, but it could save us some work." Griffith said.

Most of the IS executives and analysts interviewed said they expect the TPC and Red Brick initiatives to exist separately and perhaps even be brought together in some form. Nevertheless, most of the conclusions about benchmarking are the same — customers will continue to use benchmarking results as a simplified way of comparing "how the different players stack up," Eckerson said. □

Some IS executives said they expect the TPC and Red Brick initiatives to exist separately and perhaps even be brought together in some form.

as Informix in Menlo Park, Calif., Oracle Corp. in Redwood Shores, Calif., and NCR Corp. in Dayton, Ohio.

Red Brick is publishing two sets of specifications for data warehouse benchmarking that cover canned queries - or relatively simple environments and more complex warehouses that comprise multiple dimensions and large amounts of data. Red Brick expects to have the specifications published by early next month, with the first results expected by early June, said Steve O'Brien, director of product marketing at Red Brick. The company has no plans to ask the TPC for its blessing, a Red Brick spokesman said.

But the TPC recently asked Red Brick to help it develop TPC-D Version 2, an invitation that Red Brick "is willing to entertain," the spokesman said.

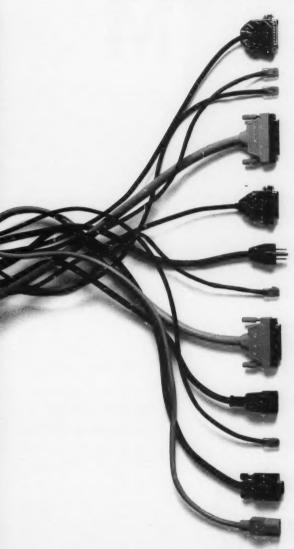
Kevin Strange, an analyst at Gartner Group, Inc. in Santa Clara, Calif., said Red Brick executives "are kidding themselves if they think they're going to get other vendors to run their systems against Red Brick's benchmark to make Red Brick look good."

Gene Alvarez, a data administrator at Nine West Group, Inc.,



NT CLUSTER~IN~A~BOX

You can configure a lot of these, or you can just plug this.



Good choice!



Get the industry's first Microsoft Windows NT clustering solution packaged in a single, rackmounted system. With Data General's NT Cluster-in-a-Box,™ your company now has an NT clustering solution that will let you run your critical applications 24x7x365, in a system that you simply plug in and turn on. Our NT Cluster-in-a-Box includes: ■ Two AViiON® AV3600R servers based on Intel Pentium® Pro processors ■ A faulttolerant CLARiiON® RAID storage system and ■ NTAlertSM - the industry's only NT-based remote service for early identification of potential problems. We also pre-load not only Windows NT Server, but Firstwatch for NT - failover software from Veritas Software. All of these components, plus service, support, and integration, from one vendor. In one package. The choice is clear. Unless you want to spend a lot of time just plugging away.

Data General

NO TIME FOR DOWNTIME - FREE SEMINARS AVOID DOWNTIME FOR YOUR CRITICAL NT APPLICATIONS.

Seminars begin in April. To register, visit our Web site at www.dg.com, or call 1-800-DATA GEN.

Managing

At Texaco, a radical rips up conventional wisdom on data warehousing to help yield millions of dollars in extra oil



JAHF

BY ROBERT L. SCHEIER

ICHAEL J. ZEITLIN lifts an imaginary four-cubicmile chunk out of the earth's surface and slices it like a delicatessen clerk would carve roast beef. With clicks of a mouse, he flips through the slices until he finds a red smudge.

"Watch this," Zeitlin murmurs, and a geologist next to him leans forward intently. They're looking at the bed of an ancient river whose smooth channel might carry oil. Using the mouse, Zeitlin lifts the underground formation out of its slice of earth, magnifies it, rotates it and even casts shadows on it like a plumber angling a utility light around a broken water pipe.

Three-dimensional data visualization applications such as this, and the data migration needed to make them work, cost Texaco, Inc. approximately \$500,000. But they al-

CHANGE AGENT MICHAEL J. ZEITLIN (CENTER) AND TWO FORMER MAIN-FRAME DATABASE ADMINISTRATORS WHO HAVE BOUGHT IN TO HIS "ASSET DATABASE" STRATEGY: IVY MILLER AND GARY TURPIN

lowed its geologists to pump \$15 million worth of extra oil last year from wells that have already been drilled, company geologists say.

That payback has brought so many requests for help from other business managers that Zeitlin says his advanced technology group is scrambling to hire enough qualified people to do the work.

To get these results, Zeitlin had to reject conventional information systems wisdom. Rather than slog through a slow-moving formal specification process, he cultivates a

Michael Zeitlin: corporate guerrilla

Thin, intense and fast-talking, 39-year-old Michael Zeitlin loves playing the role of internal hell-raiser shaking up a stodgy

As a former geologist, he says he really "feels the pain" of Texaco scientists who used to wait 90 minutes to download the data they needed to analyze an oil well. As a self-described computer geek, he's al-ways been fascinated by computers the cooler the graphics, the better. And as the youngest of three brothers, "I'm used to getting beat on a lot," he jokes. So he doesn't mind stepping on a few toes to make some needed changes. Consider his asset database strategy:

grassroots network of internal customers who tell him what they need in new applications and serve as champions to talk up his work with other users. Rather than manage data centrally in an expensive data warehouse, he creates "asset databases" on departmental servers built around a common data model so data can be kept locally but used by others in an organization as needed.

Zeitlin works for Texaco's exploration and production business, based in White Plains, N.Y., where pulling a little more oil from an existing well or cutting pennies from the cost-per-barrel means millions to the bottom line. In 1991, he proposed giving geologists the ability to "see" underground formations in three dimensions.

Moving the data is easier said than done. Consider the 'well log," which records at what depths the well passes through underground oil-bearing sands. Richard Cullip, a geology specialist at Texaco in Bakersfield, Calif., recalls that until about two years ago, it took 90 minutes just to download the well log data for California's Kern River Field from a mainframe in Houston. Then there was the matter of different data formats and definitions among the databases, such as whether to measure well depth from ground level or from the bushing that holds the well pipe as it spins.

The conventional solution for such problems is a data warehouse, a massive central storehouse of data pulled from production databases and "cleansed" to eliminate differences in format and data definitions. Decisionsupport applications such as the 3-D visualization program then pull the needed data from the warehouse.

IRRELEVANT AND EXPENSIVE

Zeitlin rejected that as too expensive and too irrelevant to the business. Creating such warehouses can take years and millions of dollars before users see any financial return. The benefits of warehouses are so unclear that some IS managers are considering charging user departments to use the warehouse as the best way to recover their costs [CW. March 17].

Zeitlin argued that the most accurate, up-to-date and well-analyzed information already is on the geologist's PC or workstation. His proposal: Maintain one copy of the data as close to the user as possible. Zeitlin's asset databases are in essence local data marts, but he doesn't plan to combine them into a central warehouse.

Zeitlin's group then wrote "loader" software to extract and cleanse data from multiple legacy databases. Some of that data, such as well logs and historic oil production data, was stored in databases within Texaco. Some of the data was generated by other oil companies and

made public by government agencies.

The loader programs transfer the data to Oracle Corp. asset databases accessed through Silicon Graphics, Inc. workstations that run Arc-View, a geographic information systems application from Earth Sciences Research Institute in Redlands, Calif. For geologists at Kern River, for example, Zeitlin's group combined well log information from the mainframe in Hous-

ton with data about temperatures

Creating that common data model is where many IS organizations fail, but Zeitlin had an advantage: a standard data model called Epicentre, created for the petrochemical industry at a cost of \$80 million to \$90 million by the Petrochemical Open Software Corp.

Although other oil companies and software vendors have been slow to adopt Epicentre, Texaco could at least use it internally. His trial run was at Kern River, which holds 25% of the company's oil reserves and where geologists were looking for ways to get more oil from 4,000 existing wells. Using Zeitlin's 3-D visualization tools "allowed our oil production to come up from 80,000 bar-rels per day to 100,000 a day," Cullip says. "We did that in a little less than a year. I don't think we would have even attempted that with our old system."

MORE LEEWAY

To be fair, Zeitlin has more flexibility than many IS managers because he runs a research lab, not a data center responsible for application or network uptime. In addition, he didn't have to design his applications for universal use right away. Most of them now involve no more than 25 concurrent users who access 4G- to 5Gbyte databases

The use of 3-D visualization software isn't unique. Phillips Petroleum Co. in Bartlesville, Okla., for example, has deployed such applications worldwide to analyze things such as seismic data, drawing information from a mix of centralized and project databases, says

SHICING THROUGH A 3-D CHUNS OF EARTH (TOP), TEXACO GEOL-SMIMALS DNA STAJOZI ZTZIĐO POSSIBLE OIL-BEARING FORMAinside the well that was already stored on users' PCs. TIONS SUCH AS THE ANCIENT RIVERBED (BGTTOM) Jacquelyn Pope, a senior geo-

physical research specialist at

Phillips. She says that at the company, the user "assumes responsibility for updating the central data store when he is finished." That is unlike Texaco, where the data is kept only at the location where it's used.

"The risk in giving the user total ownership of his data is that only he will know the most current and accurate version, and other users who need the data may not even be aware of its existence," Pope says. "Data management and ownership are real issues." While declining to be specific, Pope says Phillips managers "are reviewing our data management strategy" with such issues in mind.

Zeitlin is betting that as network speeds increase and more applications support the Epicentre model and become World Wide Web-based, it will be easier to share data among distributed databases when needed. More centralized databases should be created only when necessary for business reasons, he says, and they should be located as close to the user as possible.

Zeitlin acknowledges that it remains to be seen how well his approach will work with larger applications and when trying to perform queries across the distributed asset databases.

Local data management is a headache, Cullip says, although he said he expects that to be solved when Zeitlin's group delivers automated data management tools

Creating a cash gusher, page 78

The users like it, but the database administrators feel it's going to create a night-mare for them," he says. "And I understand their point. But we're in business to make money, not make their lives easier."

Zeitlin spends much of his time on the road at Texaco production sites, telling users how computer visualization techniques and decentralized data management can help them find and produce more oil. His short-term aim is to sell them more applications and services; long-term, he wants to find better ways to really put information technology to work

As with any true revolutionary, Zeitlin is thinking beyond the current battle. He's also lobbying other oil companies and software vendors to adopt the Epicentre petrochemical industry data model, on the theory that the more users who adopt this

standard, the easier his job will be.

"I spend a lot of my time looking for champions," he says. "i look for people who can grasp the vision, who can become the apostles . . . the people who, when they run into early problems a new technology creates, can help you overcome them."
"Working with Mike's group has been

radically different" from traditional IS organizations, says Chris Smizer, reservoir ngineering manager at Texaco in Bakers-

Zeitlin's group was able to deliver shortterm business benefit while gaining user backing for the long-term goal of distributed, easily accessible data. "The more we see the future, the more we want it." Smizer says.

Spoken like an apostle

- Robert L. Scheier

THE ZEITLIN FILE

MANE: Michael J. Zeitlin

TITLE: Fortfolio manager, Tazaça's Integral Data and Visualization Technology team, H

EFMILY: Married, three children

FAVORITE SAYING: "Water if happen!

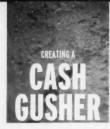
HCBRIES: Scella diving, unburni history



CONTINUED FROM PAGE 77

by year's end. "We're still trying to catch up" on learning to manage local databases for the 3-D applications, says Charles Smizer, reservoir engineering manager in Bakersfield. "But the beauty of this is that now we have a reason to develop that support and expertise."

Zeitlin's group has used its experience at Kern River to cut implementation times for smaller applications to as little as 24 hours and the cost to as low as \$2,000.



One prediction from Zeitlin's traditional IS critics has come true: His group is struggling to keep up with new requests for help. "Our challenge is we can't cope with users' expectations rising so fast," says senior database analyst Cary Turpin.

Still, that's a good problem to have. "Money is not an issue for me," Zeitlin says. "How many IT groups can do what they need to do without money being an issue?"

Scheier is Computerworld's senior editor, management.

TWO VIEWS

CONVENTIONAL VIEW

- Managing data properly is most important.
- Data used to make critical decisions should be kept in a large, centrally managed data store.
- Corganize data around functional areas of the business.
- *Applications aren't worthwhile if they can't grow to accommodate more users.
- It's too expensive to maintain distributed databases, compared with a central data warehouse.

CONVENTIONAL DATA WAREHOUSE

PROS: Central location makes data management easier. Decision-makers can get data without disrupting critical applications. Decision-makers throughout company can access same data.

CONS: Data is old before it gets to users who need it. Business managers must pay steep warehouse development costs long before they see benefit. Decisionmakers rarely return corrected, updated data to the warehouse.

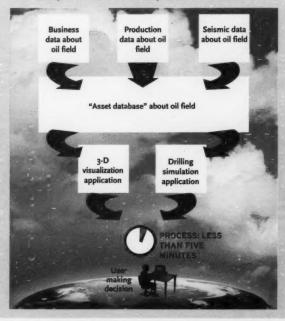
Point-of-sale system database Inventory database Corporate data warehouse Corporate data warehouse Application A Application B Application C PROCESS. UF TO YO MINUTES Use making decision

ZEITLIN'S VIEW

- "Using data properly to make money is most important.
- Data used to make critical decisions is usually on the decision-maker's hard drive, unavailable to others.
- Organize data by the corporate assets you're managing.
- Try for scalability, but if you get a big enough return for the original users, who cares?
- Distributed databases can make so much money for the company that users will pay for extra maintenance costs.

DATA MANAGEMENT AT TEXACO

PROS: Decision-makers have the most current and accurate data at their desktops. Data is moved into local databases when needed for specific business problems, thus delivering faster return on IT investment. Use of common data model paves way for future sharing of data across asset databases. CONS: Local departments must manage the asset databases, adding to their workload. Data from asset databases may be hard to share if other Texaco units or its trading partners don't adopt the common data model. Data from asset databases may be hard to share if network speeds don't increase soon.





Protects coastlines, ozone levels, blood cells generations.



When Pacific Northwest National Laboratory, the National Institutes of Health and other leading research centers tackle problems of global proportions, they start with a powerful solution: the IBM RS/6000 SP.* Its unique ability to perform large-scale computer simulations provides scientists and researchers with new ways to design lifesaving drugs, locate oil reserves, even clean up the surroundings — in less time and with less risk to the environment. And that benefits all of us. For a closer look at an RS/6000' solution to your complex science, technical or business problems, stop by www.rs6000.ibm.com/solutions or call 1 800 IBM-2468, ext. FA060.



ARE YOU READY FOR THE 'TRUST' ECONOMY?



hat new trend in the information technology field will have the most long-term impact on business? My own candidate is one word: trust. It's now clear that we aren't moving toward an information economy, but a trust economy based on information and technology.

The growth of this new economy depends on mechanisms for ensuring trust, not on technology per se.

The obvious example is electronic commerce on the Internet. Here, security is the perceived barrier to the emergence of a consumer mass market. Yet the Internet is far more secure already for credit-card transactions than our everyday casual passing of credit cards to waiters or buying goods over the phone. The 'net is becoming more secure, but people don't yet feel it's safe. They don't yet trust it.

In business-to-business electronic commerce, which has grown by 15% to 20% a year for more than a decade, the trust issue now is also the key blockage or enabler. A year ago, none of the magazines that specialize in electronic data interchange (EDI) used the word. Now it's hard to find one that doesn't have an article with "trust" in the title.

Trading-partner agreements, business relationships and customcrsupplier interactions define the trust
frontier. For example, the True Value
hardware store chain gives its suppliers access to previously secret point-ofsale data, lets them stock the shelves
and issues a purchase order after the
goods have been shipped.

In a trust economy, "partners" must change the nature of their contractual relations with each other. Otherwise, the term is just an empty cliche. In conventional "ex-post" contracts, the parties lay out who is legally liable if something goes wrong, and how that is to be determined; the contract provides the base for a court to decide. Trust economies require "ex-ante" contracting, which accepts that things often will go wrong and aims at working together and ending the fault-liability mentality.

After firms such as Chrysler, General Electric and Ford extended their electronic commerce logistics across their supply chains, they all reduced their number of suppliers, stopped playing them against one another and strengthened relationships in terms of trust and openness.

Executives also need to understand that there are two dimensions of trust trustworthiness as a value and "trustability" as a skill. Trustworthiness is about sincerity and honesty. Trustability is about reliability and competence. There are many concerns about trustworthiness in electronic relationships: deception on the Internet, hackers, viruses, authentication, digital signatures and the like. There are now far more concerns about trustability. America Online's too-rapid move toward fixed pricing breached its trust rewards fixed pricing breached its trust re-

lationship with many of its subscribers, some of whom are now suing AOL. They can't trust that they can get online as "promised."

Electronic commerce in business-tobusiness relationships is close to becoming a requirement for a well-run firm. EDI and customer-supplier links are now the norm rather than the exception.

MOVING TOWARD TRUST

All this is nothing new. Looking back over the past 50 years, it's clear that the three major shifts in business are all part of the move to a trust economy.

Total Quality Management was almost a panic reaction by U.S. manufacturers to rebuild loss of trust in their product. The customer service revolution built trust in the transaction. The move now is to build trust in relationships between customers and business. That's what customer retention, account management, private banking and mass customization are about.

IS is now fundamentally about building trust.

Perhaps we should change the term information technology to relationship technology. □

Keen can be contacted at his World Wide Web site, www.peterkeen.com.

SOURCES IS MANAGER'S BOOKSHELF

Scrategic Thicking for informative Technology armard Fr. Boar

John Wiley & Sons, New York; 266 pages; \$49.95 (paperback)

F YOU'RE A leader in an IS organization that has yet to form a strategy for the Information Age, you may find this book a help — especially if you're easily inspired by a military metaphor.

Boar, an information technology consultant who has four previous books to his credit, points out the importance of IT in tomorrow's "marketspace," a word, he says, that illustrates where the global marketplace is heading: away from stores and into cyberspace.

But until the third chapter, Boar says little that hasn't been written before about reengineering information sys-

tems into a potent competitive weapon.

He relies so much on "war" analogies that it gives you the feeling he's hammer-

ing his point home long after you get it.
But Boar begins to earn his keep from
the third chapter, when he talks about



The main message here is to prod IS into becoming a quick-thinking, proactive organization that never rests and can be a chief business driver.

Among the ideas: Using speed and agility to attack a

business problem; allying with other members of the value chain, such as suppliers and distributors, to help create advantage, and showing your staff how committed you are to following the company's goals so that they, too, will follow.

The sixth chapter is Boar's best. He ad-

vocates the organization of IS into "centers of competency," or teams of employees, with logically related sets of skills. The centers comprise an internal marketplace. They don't receive budgets — payment for their products and services comes from the "internal customers" they serve. The effect is to have IS operate like a business, constantly looking to upgrade its offerings and keep the customers happy.

Doing that would make it easier to help the entire business react quickly to marketplace change, much like an army would in war. — Rick Saia



ragtops, 4x4s, minivans showroom traffic.



When you're rolling out a new design, it helps to get a jump on the competition. That's why BMW, Chrysler, Ford, Honda and Mercedes-Benz rely on a total workstation solution: the IBM RS/6000." Working side by side, we helped these companies build tailored solutions that run the leading design applications. The result? Design teams around the world can share ideas and work more closely together — helping to reduce the time it takes to bring new models to market and new customers into showrooms. How can an RS/6000 solution drive your business? Stop by www.rs6000.ibm.com/solutions or call 1 800 IBM-2468, ext. FA058.

There are cool places on the Internet. And then there are truly hot ones-like the HotWired™

Network (www.hotwired.com), serving over two

To create one of the most dynamic Web sites, HotWired clicked on Sybase.

million page views every day. What helps HotWired generate all this heat? Sybase® We provide the database and Internet

Internet Solutions

solutions that run their site end-to-end. We make it dynamic. Personalized.

Different every time you see it. We even help track visitors' browsing habits, so content is automatically updated with each visit. Which is why more of the top Internet sites run on Sybase than any other solution. For a more in-depth look

at what we've done for HotWired, visit www.sybase.com/hotwired. Or call

us at 1-800-8-SYBASE. It's where the most dynamic Web sites begin.

© 1997 Sybase, Inc. Sybase and the Sybase logo are registered trademarks of Sybase, Inc. Outside the U.S., call 1-508-287-2591. CODE 10000645. HotWired and the HotWired design logo are trademarks of Wired Wentures, Inc.

Buyer's Guide

CUSTOMER SATISFACTION SURVEY



IVE THE EDGE TO IBM'S AS/400 group and Hewlett-Packard Co. as leaders in the distributed systems field. Meanwhile, it's tough going for Sybase, Inc. in database management and Computer Associates International, Inc. across the board. That's what the customers say.

Computerworld polled 1,690 users to measure

their satisfaction with their mainframe and distributed systems vendors. The survey focused on vendors that offer large to medium-scale hardware platforms, including system-level software such as systems management, tools and utilities. Respondents ranked their satisfaction with vendors

platforms, including system-level software such as systems management, database management, tools and utilities. Respondents ranked their satisfaction with vendors in areas such as product quality, service and support, cost of ownership and general comfort with the vendor.

The most notable results demonstrate that some vendors are satisfying their customers much more than their competitors do. For example, IBM's AS/400 scored exceptionally high satisfaction ratings in nearly every survey category. Users balked at its price, but its superior ratings in areas such as service and support, product quality and database management put the AS/400 in a league of its own.

HP had the same success in its networked printer business: It ran far enough ahead of the competition to be named the best on a statistically valid basis.

Other survey results are tighter, but they still demonstrate the different strengths and weakness of vendors. They can serve as one more tool that can be used to evaluate vendors when they come knocking. — Kevin Burden

Customer satisfaction survey, page 84

MAIN SURVEY HIGHLIGHTS

► OF THE 10 PRODUCT CATE-GORIES in this survey. HP placed first in three of the four categories in which it showed up as a significant player. 1BM placed first in three out of eight categories that were applicable to it.

COLLECTIVELY, USERS ARE MORE SATISFIED with their hardware vendors than they are with their software vendors. They're least satisfied with the cost of ownership, and their comfort with their vendor is closely correlated to their overall satisfaction.

➤ MAINFRAME USERS are more satisfied than users of distributed systems according to the scores given to mainframe hardware vendors, compared with those for server vendors.

in its three core business sectors: mainframe database management systems; mainframe tools and utilities; and distributed systems management software. PAGES 85, 92

► DELL COMPUTER CORP. ran

neck-and-neck with PCbased server rival Compaq Computer Corp. in most categories but pulled ahead of the field in price and value categories. PAGE 84

► IBM SCORED RESPECTABLE MARKS in mainframes, and the AS/400 received the highest user satisfaction grades for distributed systems. PAGE 84

PRINTERS received some of the highest overall customer satisfaction scores in the survey. HP was clearly rated best in this market. PAGE 91

METHODOLOGY THE SURVEY was sent to 4,000 corporations and large organizations selected from Computerworld's buyers' database. Respondents returned 1,690 surveys by the March deadline.

Respondents rated their satisfaction with various aspects of their primary and secondary vendors on a 1-to-5 scale, where 1 is "not at all satisfied" and 5 is "completely satisfied."

Computerworld declared winners only when a vendor emerged with a statistically valid advantage over its competitors. Other scores can't be projected to the user base at large. Standard error of the means can affect the vendor order when it is factored in.



satisfaction Servers and software

DISTRIBUTED SYSTEMS HARDWARE

SER SATISFACTION with distributed systems still falls short of user satisfaction with mainframes. For example, in overall satisfaction, only one mainframe vendor — Unisys Corp. failed to post a better score than HP, the highest-ranking distributed systems vendor. It is also interesting to note that the distributed vendors with the highest satisfaction scores were also traditional systems vendors. HP and IBM have the highest overall customer satisfaction.

But Digital Equipment Corp., despite its weakness in overall satisfaction, still made an impressive showing in many individual categories.

Critical categories such as systems quality, service, scalability and reliability were captured by those three vendors.

Which vendor had the most satisfied users?

HP, with a mix of its proprietary HP 3000 operating system and Unix-based HP 9000 sites, did best in overall satisfaction. HP was particularly strong in service categories such as responsiveness and problem solving. It also scored very well in its value for the dollar.

IBM wasn't far behind HP in overall satisfaction. In fact IBM might have ranked first in this section of the survey --- by a sizable margin - if the only IBM users surveyed were AS/400 customers. Those users gave some of the highest grades in the entire survey. But the RS/6000 user base gave the AIX-based servers only mediocre scores, which dragged down IBM's overall grades.

The AS/400's best scores came for product quality and service and support. In five separate support-related categories - which included questions on responsiveness, quality of advice and problem-solving abilities -- AS/400 users put their satisfaction level above all others. AS/400 users also gave IBM high grades in the database-management field.

As for the RS/6000, its users are the least satisfied of the survey. In nearly every category from equipment quality and value for the dollar to vendor flexibility and all five service and support questions - RS/6000 grades were lowest among the erver vendors.

But not everything was perfect with the AS/400. It scored the lowest satisfaction grade for its price range. However, the AS/400 group got a slight reprieve for value, where it scored better than the other systems vendors. James Steiger, systems manager at Genesee Management, Inc. in Rochester, N.Y.,

OVERALL SATISFACTION

Reported on a scale of 1 to 5 where 1 is "not at all satisfied" and 5 is "completely satisfied"

HP .	3.91
IBM	3.86
Dell	3.85
Compaq	3.80
Sun	3.78
Digital	3.74
Unisys	3.70

says his AS/400 still heavily taxes his budget 10 years after he installed it. "But it's reliable, we know how to manage it [and] it never surprises us with unexpected blotches, so we don't mind paying for it," he says.

Many of the AS/400 users apparently felt the same way. Its value for the dollar rivaled that of the PC vendors that bank on the value they deliver.

Two PC companies, Dell Computer Corp. and Compaq Computer Corp., scored just below systems vendors HP and IBM in overall satisfaction but fared much better in categories that relate to cost and value.

Dell and Compaq consistently scored above the survey mean in all pricing categories; Dell always held the edge over Compaq in the scores.

In categories where systems vendors have traditionally held an advantage, including reliability and scalability, the PC vendors scored lower but still did well enough to say users are generally satisfied with the sys-

Sun Microsystems, Inc. posted a respectable overall satisfaction rating but wound up near the bottom in many of the other categories. Its worst scores were in the three cost-related categories. Its value for the dollar and cost-of-ownership scores lagged behind the other vendors, plus it scored an individual low for its price. But despite how they feel about Sun's pricing, more than 92% of Sun's users said they would probably or definitely use Sun products again.

Such strong loyalty from relatively low customer satisfaction hints there is more to Sun and its products than these charted questions uncovered. For instance, technological direction - if it had been included in the chart - would have been Sun's highest score at 3.93.

Regardless of vendor or system, all users in transaction processing environments rated their satisfaction above those who use the same systems for decision support. Digital scored the highest for both processing environments, but it also had one of the largest gaps between the two ratings. - Kevin Burden

Distributed systems

HP AND IBM tended to fight for leadership positions in each of the survey's categories.

IBM EXCELLED when numbers for its AS/400 were broken out from other IBM servers, such as the RS/6000.

DELL SCORED WELL in the cost categories of the survey, posting good marks for price, value and cost of ownership.

	Users	Transaction processing	Decision-support performance	Scalability	Reliability
НР	331	3.86	3.72	3.88	4.12
IBM	569	3.89	3.69	3.82	4.15
Dell	53	3.77	3.66	3.62	3.96
Compaq	299	3.78	3.70	3.75	4.00
Sun	171	3.75	3.64	3.79	3.90
Digital	210	3.91	3.73	3.98	4.10
Unisys	43	3.80	3.66	3.72	3.83

Distributed systems management

THE PECKING ORDER stayed consistent throughout the categories: HP on top, CA at the bottom. Most of the vendors' scores dipped in cost of ownership but recovered in comfort with vendor.

	Users	Overall satisfaction	Quality	Service and support	Cost of ownership	Comfort with vendo
HP	38	3.79	3.79	3.79	3.66	3.97
IBM	103	3.59	3.60	3.57	3.48	3.72
Microsoft	30	3.53	3.55	3.48	3.53	3.71
CA	55	3.36	3.43	3.41	3.13	3.43

DISTRIBUTED SYSTEMS MANAGEMENT

ATISFACTION SCORES among the popular distributed systems management vendors ranked HP first and CA last. CA was last among four systems management vendors in overall satisfaction and in other key areas such as service and support, software quality and comfort with vendor. CA, with an overall satisfaction score of 3.36, did better in distributed systems management than it did in its two other technology areas — mainframe database management systems and main-

frame tools — but still trailed HP, IBM and Microsoft Corp.

What do these satisfaction grades really say about CA and its products? Since the grades are based on a 5-point scale and since CA's grades averaged to be about 3, users don't praise or strongly condemn the vendor. Satisfaction is strictly mediocre among the user base.

But since every other vendor managed to score higher than CA, its customer satisfaction appears far more negative than positive

CA's primary product in distributed systems management is CA-Unicenter. and their suite offerings. When asked to int

Because users were asked to evaluate their vendor and not specific products, some of the

CA respondents may have been using only elements of Unicenter or CA management tools that fall outside the Unicenter family. The same caveat applies to the other vendors and their suite offerings.

When asked to interpret CA's poor grades, one respondent said that after the sale, CA wasn't as supportive as the marketing effort led the user to believe. "Our operations people like Unicenter because it runs consistently and it's not difficult to learn. But my technical staff complains endlessly about CA because they don't get the response CA promised in their sales presentations," says John Downs, a technical support manager at Jackson-

ville Electric Authority in Jacksonville, Fla.

HP, whose primary product in the category is OpenView, got the top customer satisfaction scores in every category. It scored the highest overall satisfaction, where it received 3.79. And it got the highest score for comfort with vendor.

IBM, which primarily sells the Tivoli Management Framework, was a close second to HP in every category.

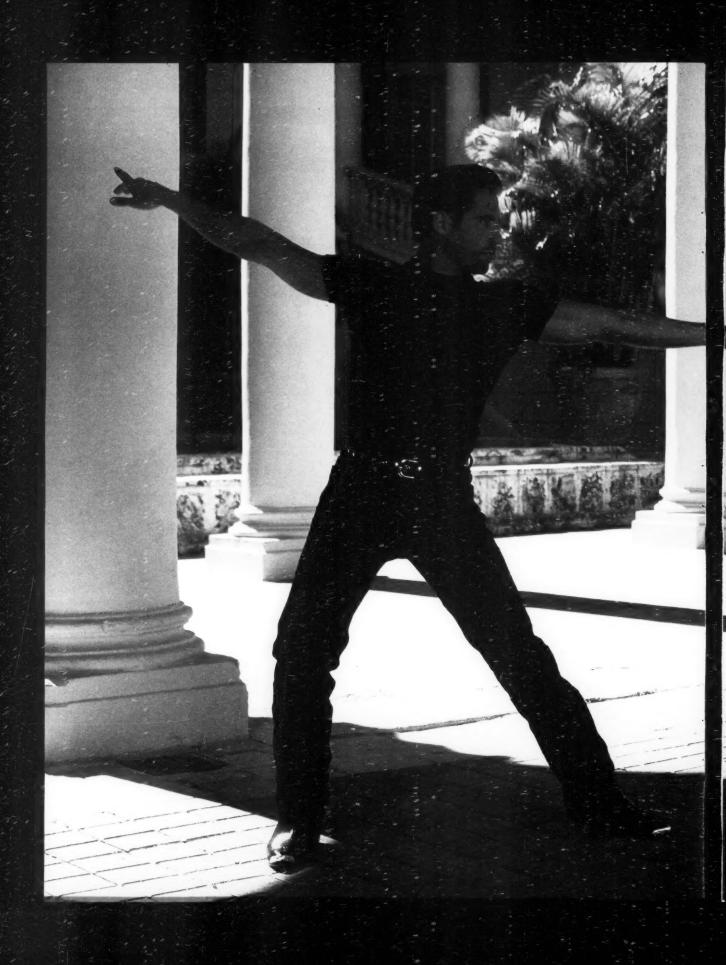
It scored well for vendor comfort but scored poorly for cost of ownership.

"We're evaluating Tivoli, but it looks like it will be twice the cost of Unicenter," Downs says. — Kevin Burden

DIGITAL'S STRENGTHS in scalability, reliability and quality were offset by weaknesses in cost of ownership, where its score dropped off.

THE INDUSTRY AS A WHOLE did better in transaction processing than in decision-support applications. MORE THAN 90% of HP, IBM, Sun, Compaq and Dell users said they would probably or definitely use the same vendor again. ALL VENDORS FELL OFF in the service and support sector, and except for Dell, they also showed weaknesses in price.

Hardware quality	Service and support	Price	Value	Cost of ownership	Comfort with vendor
3.95	3.70	3.60	3.71	3.64	3.99
3.98	3.72	3.40	3.55	3.55	3.95
3.79	3.61	3.91	3.96	3.94	3.93
3.89	3.55	3.53	3.61	3.58	3.90
3.92	3.64	3.40	3.48	3.47	3.87
3.98	3.67	3.50	3.59	3.55	3.77
3.85	3.58	3.62	3.59	3.59	3.73



You know every step.

Every move.

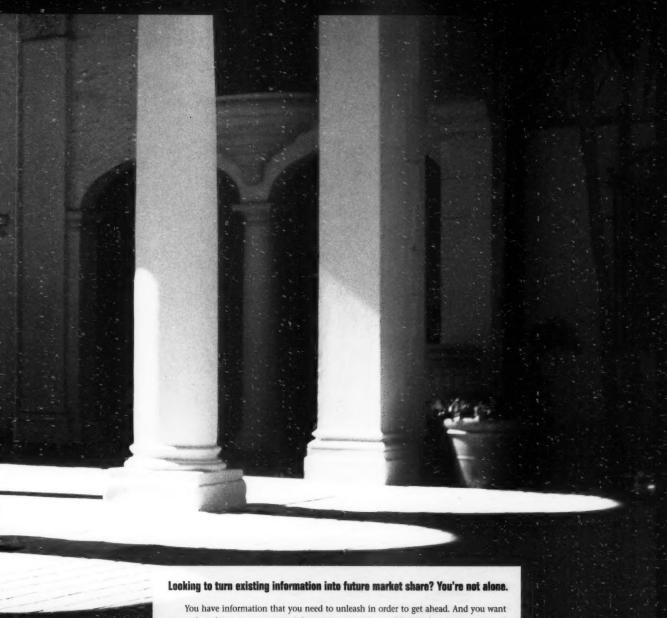
To where it becomes second nature.

Because you've danced the dance a thousand times.

And you know the only way
to keep up, is to be able to think on your feet.

Who's there to help you stay in step and keep you moving in perfect rhythm?

We are.



You have information that you need to unleash in order to get ahead. And you want to put the information at everyone's fingertips — now. You could try to do everything yourself to keep up. But that would be like dancing alone.

Let PLATINUM *technology* cut in and be your partner. Our data warehousing, reporting and decision-support tools help you leverage data to gain greater competitive advantage in the marketplace. That way, when it all comes together, information is available exactly when it's needed.

We've helped over 10,000 customers worldwide do two things: gain greater competitive advantage while maximizing their IS service levels. And we're the only company that provides the software products and services that can help you do both.

When you need a partner to keep you in perfect rhythm, look to us for the right moves.

PLATINUM technology Coming in our April 28th issue of Computerworld...

Your corporate intranet – how are you going to manage it? Technology shifts always produce info-gluts: tons and tons of reports, product announcements, articles.

COMPUTERWORLD

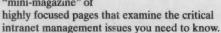
Probe 'n' Pray

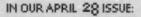
What's it all mean? Find out each month with Computerworld Intranets



A MONTHLY MINI-MAGAZINE:

You'll get information on how you can put Web browsers and other standard Internet technology to work in your internal company networks. Once a month in Computerworld we bring you a "mini-magazine" of





Systems and Network Management

With few integrated products to manage intranets, piecemeal products have to suffice for now. Users are looking for divine inspiration in the form of polling agents, centralized consoles and more rigorous administrative practices.

- How a company with 1,500 web servers and hundreds of webmasters manages its systems and networks
- A summary of the issues by a Gartner Group analyst
- A look at a web-enabled help desk
- How a pharmaceuticals giant manages content

www.computerworld.com/intranets



ONLINE:

Our full mini-magazine plus more: RealAudio interviews with high-level managers, links to the best Internet resources. interactive forums to help you find the best ideas and techniques while building your intranet.

TO REQUEST ADDITIONAL PRINT COPIES:

Ocontact: Michelle Olk Reprint Services Tel: (800) 217-7874

> Additional copies of Computerworld Intranets articles are available for \$4 each plus postage.

Published by







and its business partners.



CUSTOMER SATISFACTION SURVEY



Servers and software

Networke	dnrinters
METMOTKE	u primiers

HP SCORED a statistically valid win built on the strength of its scores for product quality, service and support, and comfort with the vendor. Lexmark challenged HP in cost of ownership.

	Users	Overall satisfaction	Quality	Service and support	Cost of ownership	Comfort with vendor
НР	951	4.24	4.33	4.10	4.09	4.30
Lexmark	51	4.06	4.14	3.98	4.08	4.16
Digital	39	4.03	4.03	3.97	3.62	4.15
IBM	248	4.02	4.05	4.04	3.84	4.11
Xerox	98	3.77	3.89	3.67	3.48	3.79

HP ATOP THE NETWORK PRINTER HEAP

EWLETT-PACKARD USERS DECLARED their vendor the hands-down winner in networked printing. They rated HP best in overall satisfaction, quality, service and support, cost of ownership and comfort level. Of 1,463 respondents who rated printer makers,

more than 950 were HP users. Other vendors in our survey trailed HP for overall satisfaction in the following order. Lexmark International, Inc., Digital Equipment Corp., IBM Printing Systems Co. and Xerox Corp.

What do users like about HP? "It's the reliability and durability of the equipment. We have HPs that we've been running for five years, and they're still chugging along," says Stephen Nees, project leader at the Automobile Club of Southern California in Costa Mesa.

"Their laser printers are just about as solid as you can find," says Milton Sans Soucie, an information systems manager at Spectral Electronics Corp. in Ontario, Calif

"HP's done a good job enabling their products to easily connect to the networks, so that makes the IS and LAN professional's job much easier," says Robert Fennell, director of the printer group at Dataquest in San Jose, Calif. "People are familiar with HP, as well."

Users and analysts agree that although HP has a good product line, it isn't perfect. For example, Sans Soucie says he likes HP lasers, but he doesn't like HP's ink-jet print-

ers. "As far as their ink-jets are concerned, Epson [America, Inc.] is making better ones," he says. His problem with HP ink-jets occurred when he tried to put a second HP 4M Jet-Direct online. "I've had trouble with it ever since. It only uses one protocol. In HP's defense, I haven't called them to talk with them about my problem. But their equipment is not the end-all."

Nees says he has also experienced minor problems with HP's JetDirect. "We've had a couple of glitches with their JetDirect Token Ring adapters, but we've figured those things out," he says. The only way he would switch from HP, he

says, would be if another vendor could demonstrate that it has greater reliability and lower operating costs. "HPs tend to be a bit pricey to operate," Nees says. "Their cost per page is not the lowest by far."

Some competing products have stronger features than HP, Fennell says.

"Lexmark has brought 1,200 dot/in. to the marketplace at mainstream prices. Xerox has very nice paper handling on their products that HP doesn't have. But having a better widget, if you will, from a specification standpoint doesn't always do the trick for you," Fennell says.

— Cathleen A. Gagne

DBMS

DRIVEN BY AS/400 USERS who were pleased with the DBMS built in to their OS/400 operating system, IBM scored a statistically valid win. The OS/400 beat out the various open systems vendors, while

Microsoft's Windows NT-based SQL Server edged to the top in the open systems group. Microsoft and Oracle Corp. scored well when users were asked whether they would buy again from their vendor. Sybase trailed the pack in most categories. One sign of how well-accepted distributed databases have become is that two-thirds of the mainframe users also were able to evaluate distributed DBMS products.

	Users	Overall satisfaction	Quality	Sarvice and support	Cost of ownership	Comfort with vender
IBM (OS/400-specific)	65	4.17	4.19	4.20	3.86	4.22
IBM (nonspecific)	161	4.03	4.04	3.98	3.84	4.08
Microsoft	188	3.71	3.71	3.55	3.71	3.75
Informix	75	3.63	3.68	3.53	3.53	3.63
Oracle	375	3.62	3.78	3.55	3.27	3.65
Sybase	153	3.41	3.47	3.33	3.40	3.39





Servers and software

MAINFRAME PRODUCTS

Mainframe hardware IBM AND MAINFRAME RIVALS Hitachi Data Systems Corp. and Amdahl Corp. out-

distanced Unisys Corp. Hitachi held a slight edge over IBM and Amdahl in overall satisfaction. All the vendors took a dip in ratings in cost of ownership.

	Users	Overali satisfaction	Hardware quality	Service and support	Cost of ownership	Comfort with vendor
Hitachi	33	4.12	4.33	4.09	4.00	4.18
Amdahl	67	4.06	4.16	4.03	3.83	4.06
IBM	441	4.04	4.32	4.06	3.61	4.08
Unisys	142	3.85	4.18	3.90	3.51	3.80

Mainframe DBMS

UNISYS POSTED SOLID NUMBERS for database management systems. IBM's key products, IMS and DB2, were on par with each other. CA fell to the bottom of the pile with weaknesses in cost of ownership and comfort with the vendor.

Mantes Evaluation, 60 Dalle 1	Users	Overall satisfaction	Software quality	Service and support	Cost of ownership	Comfort with vendor
Unisys	103	3.95	4.12	4.01	3.72	3.96
IBM	339	3.84	3.91	3.85	3.52	3.96
Software AG	41	3.61	3.73	3.54	3.24	3.46
Oracle	58	3.60	3.66	3.46	3.26	3.64
CA	89	2.94	3.37	3.08	2.89	2.93

Mainframe disk

THE TREND CONTINUES: Buyers tended to be happier with hardware than with software and services. Scores were generally positive, as they were for mainframes. Hitachi gained a slight edge on relatively few responses.

	Users	Overall satisfaction	Hardware quality	Service and support	Cost of ownership	Comfort with vendor
Hitachi	34	4.35	4.42	4.24	4.24	4.32
ЕМС	115	4.23	4.39	4.24	4.01	4.21
IBM	385	4.15	4.17	4.16	3.86	4.20
Unisys	124	3.99	4.23	4.06	3.70	3.95
Storage Tek	52	3.90	4.06	3.94	3.98	3.92

Mainframe tools and utilities

IBM GREATLY OUTDISTANCED its biggest competitor, CA, which garnered poor marks for comfort with vendor. All five vendors showed weak ratings for cost of ownership.

Users	Overall satisfaction	Software quality	Service and support	Cost of ownership	Comfort with vendor
333	3.89	3.95	3.87	3.54	3.96
93	3.87	3.91	3.85	3.66	3.88
42	3.83	3.90	3.86	3.55	3.86
28	3.57	3.69	3.66	3.41	3.55
295	3.15	3.41	3.21	2.96	3.12
	333 93 42 28	satisfaction 333 3.89 93 3.87 42 3.83 28 3.57	satisfaction quality 333 3.89 3.95 93 3.87 3.91 42 3.83 3.90 28 3.57 3.69	satisfaction quality support 333 3.89 3.95 3.87 93 3.87 3.91 3.85 42 3.83 3.90 3.86 28 3.57 3.69 3.66	satisfaction quality support ownership 333 3.89 3.95 3.87 3.54 93 3.87 3.91 3.85 3.66 42 3.83 3.90 3.86 3.55 28 3.57 3.69 3.66 3.41

It was supposed to be the launch of a development project...

Not the project manager.

Should've used UNIFACE

It's more than a development product. It's a complete solution to put complex enterprise applications into production — from legacy to client/server to the Internet. Ask any of our 3,000 worldwide customers.

For a white paper on creating enterprise a systems for the Internet, call us.



COMPUWARE

www.compuware.com 1-800-365-3608 uniface_info@compuware.com BUSINESS PROBLEM How to put <u>all</u> your business reporting on-line without lengthy deployment or extensive retraining

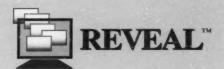
SOLUTION

REVEAL SECURE INTRANET

REPORT DISTRIBUTION

AND WAREHOUSING

- Finance and Accounting
- Sales and Service
- Human Resources and Administration
- Engineering and Production





Fast, flexible, secure network access to timecritical and historical information. All without modifying your existing computer reporting systems.

REVEAL automatically captures your mainframe, SAP, ORACLE, or other reports and makes them accessible from Windows PCs, browsers and groupware. On-line report cataloging, indexing, searching, viewing, archiving and notification of report availability, with precise page-level security control. Remote access, report mining and export to spreadsheets, e-mail, and other applications.

Eliminate fiche and paper archiving.

BUSINESS REPORT-MANAGEMENT SOLUTIONS FOR:

- Enhanced Business Performance
- · PinPoint Information Security
- · Rapid Return on Investment

Complete support with turnkey installation, integration, training, and 24 hour maintenance.

Lotus Business PARTNER



O'PIN SYSTEMS

(800) 888-1804 http://www.opin.com

In Depth

SOUND

IS RE-ENGINEERING STILL RELEVANT?



Re-engineering needs to get quicker and leaner, but in today's rapid-fire business world, it's more vital than ever

By Mike Korchinsky <

The impact of re-engineering on the collective business consciousness has been profound. More than any other movement, the instant popularity of re-engineering in the early '90s reflected the uncomfortable reality that faces organizations large and small all over the world: Change is here to stay; reinvent to compete or get left behind.

But despite its great promise, re-engineering is wrestling with a growing credibility problem, largely because of a much-publicized 70% failure

Regardless of re-engineering's high level of failure, Gartner Group, Inc. projects the market to grow by 20% per year until the end of this century. Businesses will invest in professional re-engineer-YESI page 96 Korchinsky (left) founded Axiom Management Consulting, Inc. in 1988 and was president in 1985 and was president in 1985 with Cambridge, Mass.-based Cambridge Technology Partners, Inc. Axiom became the Cambridge Management Consulting business unit, where Korchinsky is a senior vice president and general manager. He has 15 years of consulting experience and expertise in high technology, telecommunications and manufacturing.

Imposed change is bound to fail; as an alternative, organizations should try 'de-engineering'

NO! page 96

By David Coleman

We are in the middle of a re-engineering revolution with a failure rate that is greater than 70%. Michael Hammer, the prophet of re-engineering, predicted that U.S. companies would spend \$32 billion in 1996 on re-engineering efforts — and that two-thirds of those efforts would fail.

I have nothing against re-engineering per se. The idea of optimizing a process is a good one. But optimizing the process without taking into account the people in the process is the major reason re-engineering fails.

One notable re-engineering failure is the modernization of the air traffic control system. In an August 1996 report on the Federal Aviation Administration, the General Accounting Office stat-

Coleman (right) is managing director of Collaborative Strategies (www.collaborate.com), a San Francisco-based management consulting firm focused on electronic collaboration and knowledge management. He is editor of the book Croupware: Tachnology and Applications and of a forthcoming book from Prentice Hall, Inc., Groupware: Collaborative Strategies for Corporate LANs and Intranets. His Internet address is davide@collaborate.com.



YES!

CONTINUED FROM PAGE 95

ing services to the tune of \$8.7 billion by 1999, Gartner adds.

Clearly, organizations are still in pain and want to believe in the medicine. The reason? Regardless of the deficiencies of re-engineering, companies desperately need help to keep up with a relentlessly changing business environment. The astonishing potential of a technologyenabled marketplace has only magnified the challenge.

So what is wrong with re-engineering? Ironically, one of the most significant factors is the accelerating pace of change in business. In some markets, product cycles are as short as nine months, and in most organizations, planning cycles are less than three years. Yet recent surveys show that the management consulting component of re-engineering projects alone can take 20 to 40 months.

Enterprisewide initiatives that promise a perfect solution can't hope to implement change with any real-world business benefits in mind. What's worse, up to 75% of the time, re-engineering is a euphemism for cost-cutting or downsizing, unaccompanied by any significant process or technology change. Although such efforts can provide short-term profitability gains, they ignore the other side



Companies need help to keep up with a relentlessly changing business environment. — Mike Korchinsky ←

of the value equation: the need to grow business and market share profitably.

To meet that strategic imperative, companies must first define the necessary change, then address process, organizational structure, enabling technology and employee performance — all in 12 months or less. That's the way to use reengineering to capture business benefits within today's planning horizons.

In short, we need to reinvent the business of change.

So where to begin? The need for shorter time frames requires careful attention to scope. Isolate the 20% of the problem that if solved will generate 80% of the solution value. Then aggressively manage scope.

Avoid unnecessary delays such as those caused when operational solutions are disconnected from the enabling technology. Not only is technology a core element of every organization's business operations, but pairing new technologies with new processes also can shorten distances, shrink time and mine customer loyalty (order) from transaction data (chaos), thus providing a wealth of opportuni-

ties for strategic business innovation.

By shortening change efforts, you can go a long way toward resolving another cause of re-engineering failure: weak executive support. Executive support falters for several reasons. The first is a decline in executive tenure, now as short as 18 months. A traditional re-engineering project takes two to three years to complete, and the original sponsor typically moves on before its conclusion, leaving the change effort to collapse. A one-year time frame for project delivery makes executive sponsorship more secure.

The second reason executive sponsorship fails is inadequate business-case development. Without a solid business case, an organization can get halfway through a re-engineering effort before it realizes that the cost of implementation will outweigh the benefits to be captured. To prevent that, organizations should develop a business case early in the process and reassess it frequently to determine whether the effort should continue.

Finally, executive sponsorship will be more secure if senior managers believe there is consensus and ownership of the re-engineering effort in their team — not just within the ranks of the consulting organization leading the charge.

By now, I hope it's clear that the kind of change envisaged for the future, although certainly drawing on re-engineering, is a different kind of animal — still process-oriented, but more selective about which processes are addressed and how to leverage technology to best enable those processes. It's focused on achieving dramatic gains but with better assurance that you'll get there.

Undeniably, this new model of change will have victims. Some of the consulting change-mongers themselves could suffer the most. They are rightly under increasing pressure to be accountable for the success of their efforts.

But then, managing change has never been easy. The new, faster pace of today's business landscape has just made it that much harder. However, this is no time to shy away from change. More than ever, organizations that face up to the challenge of anticipating and managing business transformation will lead their industries into the future.

NO!

CONTINUED FROM PAGE 95

ed, "The FAA organizational culture has been the underlying cause of the FAA acquisition problems... FAA officials are resistant to making needed changes in their acquisition process because FAA culture rewards conservatism and conformity and discourages innovation."

The executive summary of this report says, "Over the past 15 years, FAA's modernization program has experienced substantial cost overruns, lengthy schedule delays, and shortfalls in performance. The FAA's organizational culture has been an underlying cause of the agency's acquisition problems and processes."

Here we see many processes that have been engineered, re-engineered and optimized — and still failed because the culture wasn't changed in tandem with the technology and the revamped processes.

Re-engineering in the early 1990s seemed to be a rationale for getting rid of people. It's no wonder there was a lot of resistance. Many re-engineering processes failed not because of the technology, but because of the culture.

"Re-engineering" is actually a misnomer: Many processes weren't "engineered" in the first place. Business processes tend to develop under the pressure of finding a way to get something done quickly. Often those processes aren't well thought out but are invented by the person responsible for the task. Once that person's ingenuity is implemented, it becomes codified in a procedure manual. Next thing you know, there's a new policy. A bureaucracy develops, and jobs are assigned based on the intefficiencies of the processes.

Needless to say, when a re-engineering effort is announced, people become de-

of cowboys, pioneers and rugged individualists. Their resistance becomes the greatest organizational problem in reengineering.

As we wrestle with the complex issues of technology and organization, we need a new model that encompasses both.

Most human systems contain some degree of chaos but also have the ability to self-organize. In general, it's better not to resist this dissipation, but rather to take advantage of it. I call this "de-engineering." Let the system dissipate, while

organizing. Rather than try to control change through re-engineering, the proponent of self-organization will accept dissipation and preserve resources (people, processes, knowledge, experience, for the new organization. Re-engineering sacrifices people in favor of process.

Re-engineering focuses on control and structures rather than on purpose and direction. We no longer let the structure emerge the way a stream finds its course down a hill. Instead, we try to structure a

Re-engineering efforts failed not because of technology, but because of culture. → ¬ David Coleman

fensive about their job security and resist the inevitable changes.

By nature, people are resistant to change, and organizations are exponentially more resistant. That's Coleman's Law. The corollaries are: The larger the organization, the greater the exponent number; the bigger and more complex the project, the greater the exponent will be; and the more I see the change affecting me, the greater my resistance will be.

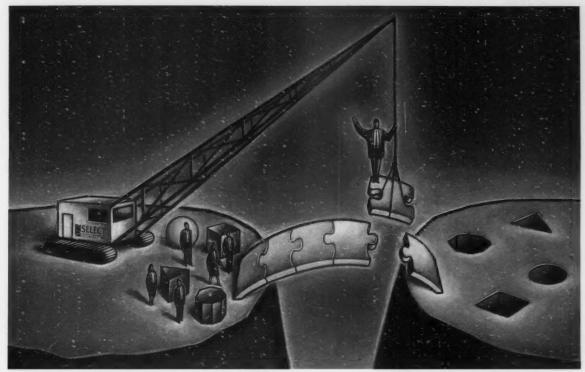
If people are generally resistant to change, they are even more resistant to the directives that accompany any reengineering effort, at least in our culture maintaining many of the resources (such as people, knowledge and experience). Most companies resist dissipation.

It's a hard concept to swallow, because it's counterintuitive. It's natural to preserve the organization and all it stands for. People get nervous when they don't know what their role will be in the new organization. De-engineering involves a lot more autonomy and self-direction for those involved and is preferable to an imposed re-engineering solution.

To move from re-engineering to deengineering, you must accept that all structures dissipate and systems are self-



process or plan the outcome. The fact that re-engineering hasn't met with great success shows that we may be taking the wrong approach; rather than impose a structure, it might be better to provide a direction and some tools to help the organization move in that direction. Then let the people re-engineer themselves. \square



Getting you there...from here.

Why start over? Building new business-critical applications that take advantage of the latest technologies does not mean throwing away your existing systems.

If your operations are like most, you have a heavy investment in your existing systems that you can't afford to abandon. SELECT offers a solution which leverages your investment, integrates it with the latest in development technology

As a unique alternative to starting over, the SELECT Component Factory" (SCF) offers a series of products that allow your investment in existing RDBMS, packages, COBOL code and CASE tools to be "wrapped" as components, and re-used in new distributed applications. In addition to these wrappers, the SELECT Component Factory also includes:

and provides component re-use. How?

 SELECT Enterprise[®] – our market leading 00 toolset for component-based modeling, supporting Unified Modeling Language notation and integrated with an enterprise-class repository;

· SELECT SE*- for large scale corporate data modeling/data management;

 SELECT Component Manager"— allowing you to register, store, browse and re-use components in your own repository or across the net.

An iterative, business-driven development process, *The SELECT Perspective*, supported by a range of consulting and training services, completes a solution for

the critical issues in software development today.

SELECT will get you there from here with real-world solutions you can use today. For more information, call us toll-free at 800.577.6633 ext. 300.

*Call for availability and pricing.

"SELECT Component Factory offers the most comprehensive solution for IS organizations facing the challenges of object-oriented, multi-tier systems," said Yvette Bohannon, senior manager, worldwide systems development



SELECT





Component Modeling for the Enterprise
19600 Fairchild, Suite 350, Irvine, California 92612
Tel: 714.477.4100 Fax: 714.477.3232
http://www.selecist.com

MSELECT

Call for a free

SELECT Component

Factory whitepaper.

Three free

Your chance to win them starts here.

If you're the programming team you think you are, you and two of your partners could win big. A brand new BMW[®] Z3 each, to be precise.

It's all part of an effort to introduce you to ForeSite, Centura's amazing tool that lets you migrate, integrate and scale all of your applications to the Web fast.

Just by using ForeSite to migrate one of your existing Visual Basic, PowerBuilder, C++, COBOL, Centura or other applications to the Web you and your two partners could each win a brand new BMW* Z3. Second and third place teams will win a Dell laptop computer for each member. Fourth, fifth and sixth place winners get a Pilot organizer PDA for each team member. And every qualified entrant wins a cool t-shirt while supplies last.

You'll find all the details, including entry forms, instructions and a free download of ForeSite on the Centura website at:

www.centurasoft.com/challenge1

Enter Centura's ForeSite Challenge now. Then go buy some sunscreen and get ready to drive home in that new Z3.

Centura Software Corporation. 1-800-444-8782 x501



centura"

IT Careers

The demand for skilled database professionals is growing, but it takes ANDIES a certain mind-set to do this work

By Melanie Menagh

Data management is a fact of life and the heart of any organization that wants to survive in the global arena. Despite this rather obvious fact, many information systems professionals still haven't acquired database skills — and that has created a booming sellers' market for those who have.

For candidates with the right skills and temperament, there are challenges, prestige and big bucks for the taking. Computerworld spoke with several IS managers and recruiters about their hiring needs and what they look for in database professionals.

CW: What is the current demand level for database skills?

CASTALDI: "I can't think of an industry where this is not a core requirement. Globally, I can't think of a case where the availability of information, getting data to the fingertips of the people who need it isn't critical, and at the foundation is the database.

EICHHORN: "Everyone we deal with is a Fortune 500 firm, and they're all looking for database people. Any shop with more than 25 people needs these skills. If you're not getting database skills, you're

Robert Castaldi is senior vice president and chief information officer at Lockheed Martin, IMS, a data services provider in Teaneck. N.I.

Paul Eichhorn is systems manager of networks at Desaulniers, MacLeod, a search firm in Chicago

Polly Ann McClure is vice president and

falling behind. If you don't have database skills in the future, you're dead."

CW: Which database skills are the most valuable to have?

EICHHORN: "DB2 is most in demand, because it's where the basic foundation of data highways in major corporations was laid, where transactions first started. There are also high volumes of shops working with Oracle and Informix, with Sybase coming up from behind."

CASTALDI: "For entry-level positions, brand-specific knowledge may not be

CIO at the University of Virginia in Charlottesville

Donald Cook is director of IS and technical services at the Naval Education and Training Professional and Technology Center in Pensacola, Fla.

Melanie Pipkin is IS project manager at Walt Disney World Co. in Orlando, Fla.

necessary. It's very important to have a good core background - a computer science or management IS degree.'

CW: What is the best way to acquire database skills?

CASTALDI: "Most companies are willing to invest in people [train in the skill] once they're on board. They'll focus them into one area or another.'

McCLURE: "Don't focus too specifically on individual database applications, but do try to become an expert in underlying principles such as designing a database so it can deliver performance. Pick Sybase or Oracle and learn it as a specific example so that in your career you can jump to the next hot ones."

CW: What qualities do you look for when hiring database professionals?

COOK: "Not everybody is [database]-able. It's lots of mental and physical work. They have to have the mental attitude to spend hours and hours on one finite detail. I don't see a lot of them with aspirations for upper management. They seem to be satisfied with the details and not overburdened by the larger picture."

PIPKIN: "We want people with good interpersonal skills. Having people who are too analytical, too technical has been a problem for us. We're trying to design open systems, make them readily available so there's more direct interaction between [database administrators] and



CW: Are certain industries or markets bet ter than others for IS professionals with database skills?

PIPKIN: "I think database expertise is having a better-defined role in an open systems environment. You used to be just a space manager, but now there's data modeling, analyzing performance and tuning. There's more and more interesting work."

EICHHORN: "Telecom, the [World Wide] Web, retail; in order to be competitive, they have to be more integrated with customers. This means storing, accessing and supplying data to more and more people."□

Menagh is a freelance writer in Maple

IT CAREERS INDEX

· Hiring competition for IS professionals shows no signs of slowing in the months ahead, according to Computerworld's new monthly hiring forecast survey. More than 20% of IS managers say they will increase their full-time staffs in the next quarter and add temporary staff and contractors.

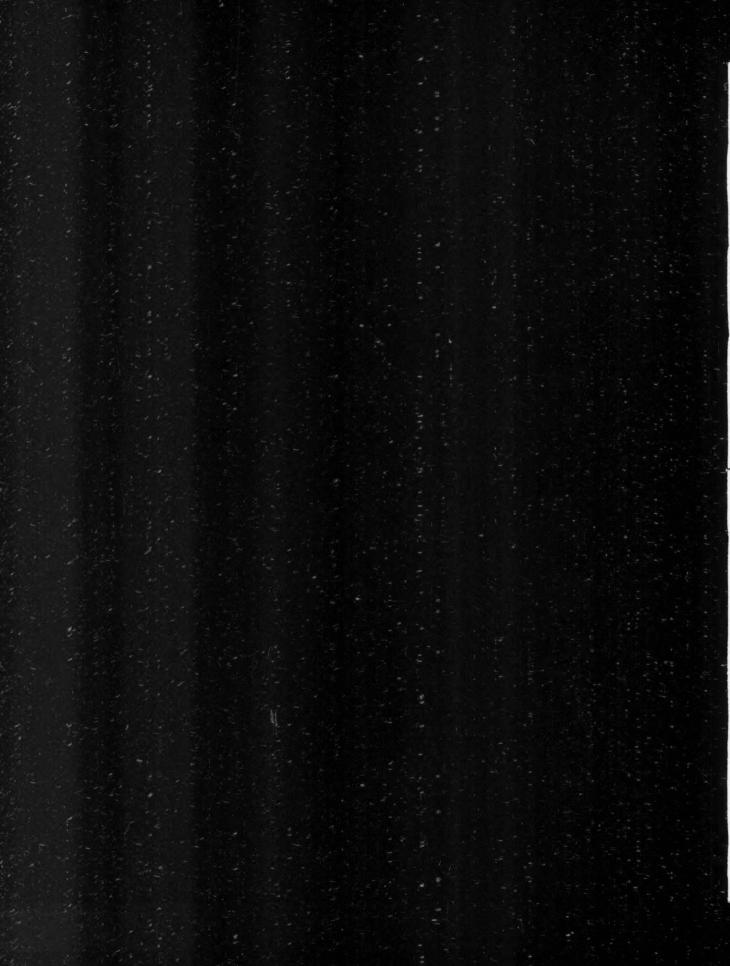
Base: 985 IS managers NA=not available

Electrical Control of the Control of	Within 3	months	Within IZ months	
Percent change in IS staff	Permanent	Temporary 13.93%	Permanent 2.42%	Temporary NA
Percent of managers increasing staff	20.7%	9.1%	21.39%	6.26%
Percent of managers decreasing staff	NA	NA	2.89%	4.02%
Percent of managers maintaining staff levels	NA	NA	75.72%	89.72%

Current staff mix

Permanent 95.1%

Temporary 4.9%



IT Careers

The demand for skilled database professionals is growing, but it takes a certain mind-set to do this work DANDIES

By Melanie Menagh

Data management is a fact of life and the heart of any

organization that wants to survive in the global arena. Despite this rather obvious fact, many information systems professionals still haven't acquired database skills — and that has created a booming sellers' market for those who have.

For candidates with the right skills and temperament, there are challenges, prestige and big bucks for the taking. *Computerworld* spoke with several IS managers and recruiters about their hiring needs and what they look for in database professionals.

CW: What is the current demand level for database skills?

CASTALDI: "I can't think of an industry where this is not a core requirement. Globally, I can't think of a case where the availability of information, getting data to the fingertips of the people who need it isn't critical, and at the foundation is the database."

EICHHORN: "Everyone we deal with is a Fortune 500 firm, and they're all looking for database people. Any shop with more than 25 people needs these skills. If you're not getting database skills, you're

Robert Castaldi is senior vice president and chief information officer at Lockheed Martin, IMS, a data services provider in Teaneck. N. I.

Paul Eichhorn is systems manager of networks at Desaulniers, MacLeod, a search firm in Chicago.

Polly Ann McClure is vice president and

falling behind. If you don't have database skills in the future, you're dead."

CW: Which database skills are the most valuable to have?

EICHHORN: "DB2 is most in demand, because it's where the basic foundation of data highways in major corporations was laid, where transactions first started. There are also high volumes of shops working with Oracle and Informix, with Sybase coming up from behind."

CASTALDI: "For entry-level positions, brand-specific knowledge may not be

CIO at the University of Virginia in Charlottesville.

Donald Cook is director of IS and technical services at the Naval Education and Training Professional and Technology Center in Pensacola. Fla.

Melanie Pipkin is IS project manager at Walt Disney World Co. in Orlando, Fla. necessary. It's very important to have a good core background — a computer science or management IS degree."

CW: What is the best way to acquire database skills?

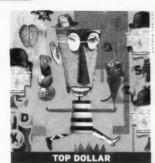
CASTALDI: "Most companies are willing to invest in people [train in the skill] once they're on board. They'll focus them into one area or another."

McCLURE: "Don't focus too specifically on individual database applications, but do try to become an expert in underlying principles such as designing a database so it can deliver performance. Pick Sybase or Oracle and learn it as a specific example so that in your career you can jump to the next hot ones."

CW: What qualities do you look for when hiring database professionals?

COOK: "Not everybody is [database]-able. It's lots of mental and physical work. They have to have the mental attitude to spend hours and hours on one finite detail. I don't see a lot of them with aspirations for upper management. They seem to be satisfied with the details and not overburdened by the larger picture."

PIPKIN: "We want people with good interpersonal skills. Having people who are too analytical, too technical has been a problem for us. We're trying to design open systems, make them readily available so there's more direct interaction between [database administrators] and



IS hiring managers say database professionals can expect the following salaries this year:

CASTALDI

Entry level \$35,000-\$45,000 Midlevel \$45,000-\$65,000 Senior level \$65,000-\$120,000

EICHHORN

Entry level \$40,000 Midlevel \$50,000-\$55,000 Senior level \$60,000-\$70,000

McCLURE

Senior level \$50,000-\$60,000 (academia)

Senior level \$90,000-\$100,000 (private sector)

CW: Are certain industries or markets better than others for IS professionals with database skills?

PIPKIN: "I think database expertise is having a better-defined role in an open systems environment. You used to be just a space manager, but now there's data modeling, analyzing performance and tuning. There's more and more interesting work."

EICHHORN: "Telecom, the [World Wide] Web, retail; in order to be competitive, they have to be more integrated with customers. This means storing, accessing and supplying data to more and more people." □

Menagh is a freelance writer in Maple Corner. Vt.

IT CAREERS INDEX

Hiring competition for IS professionals shows no signs of slowing in the months ahead, according to Computerworld's new monthly hiring forecast survey. More than 20% of IS managers say they will increase their full-time staffs in the next quarter and add temporary staff and contractors.

Base: 985 IS managers NA=not available

Within 3 months		Within 12 months	
Permanent	Temporary	Permanent	Temporary
1.9%	13.93%	2.42%	NA
20.7%	9.1%	21.39%	6.26%
NA	NA	2.89%	4.02%
NA	NA	75.72%	89.72%
	Permanent 1.9% 20.7% NA	Permanent Temporary 1.9% 13.93% 20.7% 9.1% NA NA	Permanent Temporary Permanent 1.9% 13.93% 2.42% 20.7% 9.1% 21.39% NA NA 2.89%

Current staff mix

Permanent 95.1%

Temporary 4.9%

see the following EMPLOYERS at COMPUTERWORLD'S IT Careers web site*

Armstrong World Industries, Inc. **Champion International Corporation** The Consulting Alliance **Deckers Outdoor Corporation** Electronics For Imaging, Inc. (EFI) FourGen Software Technologies, Inc. Frankenmuth Mutual Insurance Company **Frontier Corporation Hibernia National Bank Hyperion Software Corporation Liberty Mutual Logic Works** Mayo Clinic Arizona **National Semiconductor** Newport News, Inc., Sub. of Spiegel, Inc. **Paranet Raytheon Electronic Systems** Sterling Software, Scientific Systems Division Temple-Inland Forest Products Corporation **Thomson Financial Services Unisys - Global Customer Services** Wal-Mart Stores, Inc.



Yellow Technology Services

* And search for opportunities there too

http://careers.computerworld.com

We have the largest selection of jobs the WEB has to offer! DICE has thousands of contract and full-time listings for Programmers, Analysts and Technical professionals to fill open positions for companies nationwide.

What's even better - we're FREE, providing detailed information so you can find the right contract or full-time position in your area AND your area of expertise. Take a look for yourself. Please contact DICE at www.dice.com or telnet dice.com or call up our BBS, using your computer & 1200-28.8 baud Modem, 8-N-1.

> ONLINE INTERNET

515-280-3423 telnet dice.com

www.dice.com

DATA PROCESSING INDEPENDENT CONSULTANT'S EXCHANGE (

Don't gamble with your job search. Use DICE.

A Service of D&L Online, Inc: 515-280-1144

OPEN YOUR NETWORK TO EXCELLENCE

tions worldwide. PROGRAMMER ANALYSTS WANTED. Multiple openings for all positions. All positions, unless otherwise stated, require 2 years experience in the job duties specified and a Bachelor's in Computer Science, Systems Analysis, Computer Information Systems, Computer Engineering, Electrical Engineering, Electronic Engineering, Mathematics or the foreign equivalent. All positions are 40 hrs/wk., 8a-5p, M-F.

DMS II, COBOL, INGRES, GEMCOS and CANDE. \$48,000/yr.

Ref #11 - Analyzing, designing, developing and implementing systems and using Visual Basic, SQL-Server and Visual C++. \$43,500/yr.

Ref #12 - System studying, desinging and developing and using Structured Analysis and Design methods in database design and using Informix Online, Informix 4GL and Informix SQL. \$55,000/yr.

Ref #13 - Defining requirements and resolving issues; analyzing, desinging and developing using DB2, CICS, IMS DB/DC and COBOL 2. Will accept 3 years college education and 3 years exp. as a computer professional in lieu of the required Bachelor's degree and 2 years. exp., provided that 2 of the 3 years exp. as a computer professional are in the job duties specified. \$60,000/yr.

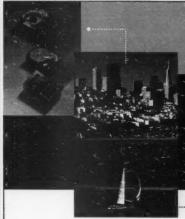
Ref #14 - Designing and developing applications using CICS, DB2 and COBOL II.

Ref #15 - Analyzing and designing systems and coding programs; testing, implement-ing and using COBOL and a database management system. Will accept 18 months exp. in the job duties. \$46,000/yr.

Ref #16 - Analyzing and designing; coding, testing and implementing applications using C++ and SDK. \$44,000/yr.

MUST Submit One Original Resume For Each Job Applied and MUST Include Job Reference Number(s).

Respond to: Kim Pockock (Insert Reference *), Syntel Inc., 2800 Livernois, Ste. 400, Troy, Michigan, 48083 or FAX (810) 619-2895. EOE M/F/D/V.



BEHIND EVERY ACHIEVEMENT. YOU'LL FIND AN EXTRAORDINARY DRIVE.

Quantum in California — The Mass Storage Company!

Inside every drive there are enormous possibilities. After all, we didn't get to be the biggest name in storage technology by thinking small. From microprocessor technology to electromagnetics to software, we offer a greater breadth of technological challenges to a wider range of engineering professionals than companies making the PCs themselves. Now that's an achievement

And we do it all in Milpitas, at the core of the Silicon Valley — the Mecca of high technology. And it's all just a heartbeat away from the excitement of San Francisco and the abundant natural beauty and almost limitless brilliant cultural centers of the Bay Area. Quantum/Milpitas offers you the balance and career advancements that can't be matched at any other company in any other place. Be part of a team that has successfully implemented the world's largest Oracle Systems Integration project.

Network Analyst

Design, install, and support Quantum's local and wide area networks. BSCS and/or equivalent experience with knowledge of current network technologies, including TCP/IP, routers, leased lines, frame relay, hubs, and switches. UNIX experience a plus.

Senior UNIX Systems Administrator

Responsible for auditing of servers, performance and tuning of servers, and capacity planning. Requires BSCS, or equivalent, plus 5 years' experience in UNIX Systems Administration (HP-UX). Should have knowledge of UNIX OS internals and network protocols such as TCP/IP, NIS, and NFS. Familiarity with relational databases and Internet a plus.

Oracle Applications Programmer/Analyst

Must have a BSCS with a minimum of 5 years' experience in application development and support. Must have at least 1 year of experience with Oracle Financials and/or Oracle Manufacturing

Other opportunities include:

MIS Project Management Oracle DBA

PeopleSoft Programmer/Analyst

LAN/WAN Services System Engineer **Communications Analyst**

Network Services System Administrator Senior HP-UX Systems Administrator

For consideration, please mail or fax your resume to: Quantum, Human Resources Dept., ADCW0421DJ, 500 McCarthy Blvd., Milpitas, CA 95035; fax (408) 894-4152. For more information on job opportunities, lease see us on the World Wide Web: http://www.quantum.com. E-mail: jobs@qntm.com. Modern access: (415) 903-5815. 8, N, 1 ANSI/VT100. Principals only. Equal opportunity employer M/F/D/V.

CAPACITY FOR THE EXTRAORDINARY



ORACLE

DBA, Modelers Mgrs, Developers up to

200k

Over 503 ORACLE Positions Nationwide On ETS Website

fax: 612-937-1426

The placement of SAP sionals - all m

We have low overhead so we can pay you top rates.

People Unlimited
1811 Sordis Per M

PeopleSof



IT CAREERS

Consultant needed for computer consultant from located in Desertield, Illinois, Job duties included period of the consultant from located in Desertield, Illinois, Job duties included period of the computer programs apply located to the technical architecture utilized to develop the computer systems, Identify, evaluate, and decline user requirements for new mine the cost and effort required for development. Consult with users to identify process flow dispersion of the computer systems, and sechnical reports in order to specify how the systems will be developed to astisty user needs, Propare data models, process flow dispersion of the systems will be developed to astisty user needs. Prepare data models, process flow dispersion and prototypes. Design and develop system specifications and program specifications and program specifications and program specifications and program appears of the computer special control o

DATABASE **EXPERTS**

blocating or desire more challenge? Our focus is D.B. Technology We list outstanding, permane positions across the U.S.A. Relocation & Foes Paid

DBA/Tech Support to \$95k Oracle DBA to \$75k

C/S Development to \$65+stock INFORMIX DBA to \$57k

Oracle/MFG to \$65k

HAMILTON

email: htp@mhv.net http://wwwl.mhv.net/~htp/

SOFTWARE ENGINEER
Design, develop and test comcastonic, analyze software requirements to determine feasibility of design, index software subtient to the state of the st SOFTWARE ENGINEER

OPPORTUNITIES

THE COMPLTER-TECH NETWORK
SE NATIONWED COMPLTER SEARCH
ACCEPTED SPECIALIZES IN THE
ACMICIES SPECIALIZES IN THE
ACMICIES SPECIALIZES IN THE
ACMICIES SPECIALIZES IN THE
ACMICIES SPECIALIZES
THE SAME ACCEPTED SERVER
THE ISA & OVERSEAS.

COMPUTER HAH NETWORK

Software Engineer, 40 hrs/wk, 3am-5pm, \$45,000/yr. Design, ware for management information systems using client/servet technology. Database programming across multiple serversming across serversming across serversming across serversming across to the serversming across serversmine ser

SOFTWARE ANALYST/DEVELOPER to maintain and develop
Design CAD 3D for Windows.
DOS, Macintosh and/or VOIX
versions: The job requires: the
Computer Design/Drafting for
any of these versions. The applicant must have at leest a
Masters Degree in Computer
Science. Me ch an ic at I
Masters Degree in Computer
Science. Me ch an ic at
Masters Degree in Computer
Science. Me ch an ic at
Masters Degree in Computer
Science. A D. Computer
Science in Ca. D. Computer
Science in Ca. D. Computer
Inginering. The applicant must
have one year experience in
CA. D. Computer
Authorities of the properties of the computer
Matter Science in Computer
Autolisp programming law
autolisp pr

IBS-2582.09-bot774.

Rechnical Consultant, 40 hrs/wik, 8am-5pm, 985,000/yr. Design, develop, maintain & support interaction of the programment of the programment activities. The programment of the programment of the programment System (RMS). Technical training & support. Tools: TANDEW, IBM-F, CS-Based-ATM-Fort (MS). Technical training & support. Tools: TANDEW, IBM-F, CS-Based-ATM-Fort. Design & State (MS). Technical training & support. Tools: TANDEW, IBM-F, CS-Based-ATM-Fort. See (MS). The State (MS). The

SOFTWARE ENGINEER: (2 positions) 40 hrs/wk. 8 a.m. - 5 p.m., \$49,000 yr. Carry out the systems analysis, systems design, coding and lessing of a series of the systems analysis, systems design, coding and lessing of a series of the systems analysis, and series of the systems o

Chicago Area CORPORATE TECHNICAL RECRUITING CONFERENCE CO' L'ILE WORLD

For information: 1-800-488-9204

Application Developer: 40 hrs/wic. Nam-Spon. \$32.500/pr. Software & maintenance. Write programming specifications for change and an anomalous control of the change of the

Software engineer with two years of experience as a s/w years of experience as a s/w sional, who will develop s/w sional, who will develop s/w systems, opplying computer science, engineering, and methematical analysis, with two years of experience using control of the side of the s

SOFTWARE ENGINEER. Job location.
Client sates throughout the U.S. Design develop write test debug, document, troubleshoot & support algorithms & subsiness applications software nickswer of developing program specifications; and support lightleshoot of support algorithms & control of the subsiness applications software nickswer of developing program specifications; and support littleshoot subsiness applications of developing and support of the subsiness and support of the support of the subsiness and subsines locate to client sites throughout the U.S. employer paid. Send resume in duplicate to Bonne Stauffer, Interim Technology, Inc., 2050 Spectrum Blvd, Fort Lauderdate, FL 33309

Programmer Analyst

Analyze, design, program, debug, code, test, main-tain, integrate, & docu-ment batch & on-line sysment batch & on-line systems using SAP R/3. 40 hrs/wk; \$59,000/yr; BA/ BS degree in Comp. Sci., or Math. or Engg., or Statistics w/ 2 yrs. exp., (includes 1 yr. in use of SAP/3). Send 2 resumes to: Case # 70044, P.O. Box 8968, Boston, MA 02114.

Find training now.

Imagine the time saved if you could search one solid database of 1.T. Now you can by simply accessing Release 1 of CareerAgent: careeragent.computerworld.com

While you're there, check out the preview of upcoming CareerAgent releases. They'll allow 1.T. professionals, individually or through corporate subscriptions, to assess learning styles, establish career goals, calculate individual, group and department skill gaps with an intelligent decision support system, and focus a training search based on priority.

The point? Every individual on your tearn has an idea of their career plan, and knitting these plans together can benefit corporate goals. Think about your current team today. Do individual career plans in your organization seamlessly benefit from available projects? Training resources? Corporate goals? Is this information connected to cost-effectively reskill and retain staff? It's all possible with CareerAgent, where management and staff can collaborate to continuously develop a career "itinerary" for each individual. On the Internet or your intranet. Your choice.

For details, see careeragent.computerworld.com or call 1-800-343-6474, x6000 today. And make every career on your team what it should be: a well-planned journey of enrichment.



COMPUTERWORLD

Information you need may be passing you by. Subscribe today!

accept your offer of \$39.95 per year - a savings of over 73% off the single copy price.	ButBinkESsWBUSTRY (Cited one) Manufacturer (other than congoler) Manufacturer (other than congoler) Data Ties, Connection Moderal Law Education Moder
COMPANY E-MAIL ADDRESS ADDRESS CITY Address Shoer: © Home © Business © New © Renew Single copy price: \$3.00/reun *U.S. Orly; Canada 960, Mexico, Control/Bouth America \$190, Europe \$390, oil offer countries COMPUTERWORLD	Administrative Services So. Business Services (except DP) 60. Government - State/Federal J. Local 65. Communications Systems Public Utilities Transport attor Tich. Management To. Management Computer Public Systems or Peripheral Boaler Systems Integrators, VARs, Computer Service Bureau Systems (Nass, VP) Systems Integrators, VARs, Computer Service Bureau Systems (Nass, VP) Systems Integrators, VARs, Computer Service Bureau Systems (Nass, VP) Systems Integrators, VARs, Computer Service Bureau Systems (Nass, VP) Systems Integrators, VARs, Computer Service Bureau Systems (Nass, VP) Systems Integrators, VARs, Computer Service Bureau Systems (Nass, VP) Systems Integrators, VARs, Computer Service Bureau Systems (Nass, VP) Systems Integrators, VARs, Computer Service Bureau Systems (Nass, VP) Systems Integrators, VARs, Computer Service Bureau Systems (Nass, VP) Systems Integrators, VARs, Computer Service Bureau Systems (Nass, VP) Systems Integrators, VARs, Computer Service Bureau Systems (Nass, VP) Systems Integrators, VARs, Computer Service Bureau Systems (Nass, VP) Systems (N
Information you need may l	be passing you by. Subscribe today!
Yes, I want to receive my own copy of CONTRIBUTED each week. I accept your offer of \$39.95* per year - a savings of over	Please complete the questions below.

Yes, I want to receive my own copy of CONFUTENDOLS each week.	Please complete the questions below.	
I accept your offer of \$39.95* per year - a savings of over 73% off the single copy price.	1. BLISHRESS/MOUSTRY (Circle one) 10. Manufacturer (other than 10. Manufacturer (other than 20. Texturer (other than 20.	e:
FIRST NAME III LAST NAME	40. Wholesale/Retail/Trade Administrative Services (a) Solaris (e) Ma 50. Rustiness Service (except DD) 23. Dir/Mgr. Sys. Development, (b) Measure (c) Ma	c OS
TITLE	. 60. Government - State/Federal/ System Architecture (c) OS/2 (g) Will Local (c) OS/2 (d) Will Local (d) Univ. (e) Medical (c) OS/2 (d) Will Describe (d) Univ. (e) Medical (d)	
	65. Communications Systems/ Public Utilities/Transportation 41. Engineering, Scientific, R&D, App. Dev. Products	J Yes
COMPANY	Petroleum/Refining/Agriculture 60. Sys. Integrators/VARs/ Intranet Products	☐ Yes
E-MAIL ADDRESS	Computer-Related Systems or CORPORATE MANAGEMENT	
L-WALL POSTELOS	Peripherals 11. President, Owner/Pertner, 4. Which of the following 85. Systems Integrators, VARs, General Mgr. do you buy, specify,	
ADDRESS	Computer Service Bureaus, 12. Vice President, Asst. VP or approve the purch Software Planning & Consulting 13. Treasurer, Controller, Financial (Check all that apply	
	Services 90. Computer/Peripheral Dealer/ DEPARTMENTAL MANAGEMENT (a) internet softwa	
CITY STATE ZIP	95. Other 51. Sales & Mktg. Management (c) Web authoring	1
Address Shown: ☐ Home ☐ Business ☐ New ☐ Flenew Single copy price: \$3.00/seue *U.S. Only. Canada \$95, Mexico, Centrai/South America. \$150, Europe \$295, all other countries	TITLE/FUNCTION (Circle one) 2. TITLE/FUNCTION (Circle one) ANALOGMENT	iols
COMPUTERWORLD	IS/MMS/DP MANAGEMENT 19. Chief Information Officer/Vice President/Asst. VP IS/MIS/DP 19. Chief Information Officer/Vice President/Asst. VP IS/MIS/DP 19. Chief Tritide Presament 10. Sept. Chief Presament 10	net?
AAIIII ALFIIIIAIIFD	Management	B4D7

Inform	nation	you	need	may	be	passing	you	by.	Subscr:	be	to	day	1
Yes, I want to	receive my ow	n copy of l	OUT UTERWOOL	each week		Plea	se com	plete t	the questions	bel	ow.		
l accept y	our offer of \$3 he single copy	Det ackre	year - a sav	ings of over	1.1	BUSINESS/INDUSTRY (Circl O. Manufacturer (other the computer) CO. Finance/insurance/Real	n oraș	Informa 22. Dir./Mgr Data/Te	: MIS Services, tion Center : Network Sys., te. Comm., LAN Mgr./PC ch. Planning.	re (C	you use, e commend, ircle all tha erating Sys	purchase t apply.)	10
FIRST NAME	MI		LAST NAME			 Medical/Law/Education Wholesale/Retail/Trade Business Service (except) 	r ur)	Adminis 23. Dir./Mgr	trative Services : Sys. Development, Architecture	(a)	Solaris Netware	(e) Mac	: OS dows NT
TITLE						 Government - State/Fed Local Communications System Public Utilities/Transpor 	ns/	3). Program Softwar	nming Management, e Developers ring, Scientific, R&D,	(di	OS/2 Unix p. Dev.Prod	(g) Win (h) NeX	
COMPANY					7	Mining/Construction/ Petroleum/Refining/Agr Manufacturer of Comput	iculture	50. Sys. Intr	anagement egrators/VARs/ ing Management	No	tworking Produced Pro	roducts	J Yes J J Yes J
E-MAIL ADDRESS						Computer-Related System Peripherals 35. Systems integrators, VA Computer Service Bure	Rs,	fl. Presider General 2. Vice Pre	esident, Asst. VP	de	hich of the you buy, s approve to	specify, r	recommen hase of?
CITY	SYA	TE	ZIP		-	Software Planning & Co Services RO. Computer/Peripheral De Dist./ Retailer RS. Other	nater/	Officer DEPARTMEI 51. Sales &	NTAL MANAGEMENT Mktg. Management	(a)	Interne Interne Web au	t softwar t browse	re rs
Address Shown: @ Home *U.S. Only. Canada \$85, N			Single copy prio Europe \$286, al		-	(Please Specify)	1		Legal, Accounting Mgt. FESSIONAL	F		ment to	

COMPUTERWORLD

Educators, Journalists, Students

B4D:

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P O BOX 2044 MARION OHIO 43306-4144 NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES



BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P O BOX 2044 MARION OHIO 43306-4144 NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES



Mahalladlallandladaladladaladla

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P O BOX 2044 MARION OHIO 43306-4144 NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES



Reserve



August 25, 1997

For information: 1-800-488-9204





Fast-growing national and international consultancy with a reputation for first-class consultant offers WORLD-WIDE CAREER OPPORTUNITIES FOR

TOP QUALITY PROFESSIONALS

CURRENTLY STAFFING PROJECTS IN:

US, Canada, South America, Pacific Rim and Europe: Especially in these skills and industries: FI/CO, Basis, ABAP/4, PM, MM, WM, PP, SD, EDI in SAP Environment, Supply Chain/Manufacturing, Utilities and Retail Experience in an SAP Environment.

▲ EXPERIENCED PROJECT MANAGERS \$ 180K + **▲ TEAM LEADERS**

▲ CONSULTANTS

RECRUITING MANAGER - Minimum 5 years experience in a technical environment, preferably SAP.

Competitive compensation with performance incentives for strong professionals with deep experience; comprehensive benefits package.



CASMRASS

System Consultants (US) Ltd.

99 Seaview Blvd., Suite 340, Port Washington, NY 11000 • voice 516-625-9000, fax 516-625-9687 55 Broad St., Suite 13F, New York, NY 10004 • 212-968-1346, 212-968-1348, fax 212-968-1352

e-mail spear1@interramp.com • world wide web http://www.spearhead.com

SAP™ National Implementation Partner

We were consulting before consulting was hot.

For more than 25 years, CPL WorldGroup has successfully placed highly-skilled computer consultants. Don't you think your skills deserve that kind of experience?

Right now, we need lots of NATURAL/ ADABAS developers along with some COBOL/CICS/DB2 people.

Interested? Fax or E-mail your resume to 510/472-4904; contract@cplworldgroup. com



If you're an experienced PROGRAMMER, ANALYST or MANAGER with background in ORACLE, SQL, RDBMS, VAX, or MAXCIM, opportunity awaits you at Spacelabs Medical.

Localed in the beautiful Pacific Northwest, we offer professional challenge, career growth opportunity and a great place to live! Check out our MIS openings on our homepage @ www.spacelabs.com. If you like what you see, follow the response instructions on the website and we'll examine our future together. Or please send/fax your resume to: Spacelabs Medical, Inc., Dept. PROAM, P.O. Box 97013, Redmond, WA 96073-9713. FAX (206) 702-2377. E-mail to resumes@slmd.com



FOE.

would have *loved* our Data Center.



Our Data Center is built to withstand tornado-force winds of up to 250 mph. If you're an IS professional with brains, heart, and a little bit of courage, come check us out.

Data Analyst

- 2+ years experience in Data Modeling, including entity/relationship diagramming
 - · Strong Data Analysis/Data Administration experience

MVS Systems Programmer

 2+ years MVS Systems Programming or DASD Storage Management/Administration · SMS, DMS, HSM, VAM, TM, JES, ISPF are pluses

ork with the most functionally rich shareholder accounting and information system in the industry. DST Systems, Inc. is the nation's largest information processor for the financial services industry. Employing over 5,000 associates, including 1,000 DP, DST designs, develops and operates proprietary software systems to provide shareholder information to the mutual fund, insurance and banking industries

DST Systems, Inc. / 333 W. 11th St., 3rd Floor Kansas City, MO 64105 phone 1-800-874-0174 / fax (816) 435-8618







Positioned For Growth

We are search consultants specializing in Information Systems personnel. Our clients are some of the strongest and best known in the area. If you are inter-ested in keeping abreast of challenging situations that will enhance your career



P.O. Box 22426 Louisville, KY 40252 (800) 301-1582 Fax: (502) 394-9443

Computer Programmer. Work as member of team responsible for member of team responsible for development and design of development and design of development and design of development and design of development and development and development of the development of

Programmer Analyst needed for computer consulting firm located in Duluth, Georgia. Job cuttes include: Software consulting on various in-house projects and/or contract basis. Job consulting on various in-house projects and/or contract basis. Job computer applications using state-of-the-art tools and computer applications using state-of-the-art tools and schinques. Install and administration of the contract of the contract of the contract of the computer Science. A foreign degree is acceptable in determined to be equivalent by a necessity of the contract of the contrac

Senior PC Specialist, 40 hrs/wk.
9am-5pm, \$42,465/yr. Install PC.
ware. Maintain assigned computer tools in internal data systems division. Test new client configurations. Assist PC techniques Learn & maintain assigned to the configuration. Swelpo advanced troubleshooting systems. Conduct end user evaluations. Develop advanced troubleshooting exchingues. Learn & metall applications. The configuration of t Microsoft Office: Internet Web Frowser; assisting users on net-work & software: PC trou-beshooting, Must have proof of nently in the U.S. Send two copies of both resume and cover letter to: II.LINOIS DEPART-MENT OF EMPLOYMENT PERFECTION OF EMPLOYMENT Street - 3 South, Chicago, II. 66065, Attention: Dennis Jones. Reference #V-II-18912-D. NO CALLS. An Employer Paid Ad.

Recruit '97. Technically speaking, it's the best career move you can make.

THE INFORMATION TECHNOLOGY CAREER EXPO

at Infomart 1950 Stemmons Freeway

Dallas April 30 - May 1 10:00 am - 7:00 pm



Excellent full-time & consulting opportunities available with the nation's leading technology and other high profile companies.

- · MINIMUM two years of industry experience
- Free Admission With Résumé
- To Pre-register for the Show, visit our Web site at http://www.recruit97.com
- To be listed on the Recruit '97 National Job Databank, Mail or E-Mail your résumé to:

Recruit '97 One Penn Plaza New York, NY 10119

E-Mail: resume@recruit97.com

OFFICIAL SPONSORS:

CAREERMagazine

un Miller Freeman

Recruit '97 is produced and managed by Miller Freeman, Inc. One Penn Plaza, New York, NY 10119 800-829-3976 * 21:2714-1300 * Fax: 212-643-4801 lotographs taken dyou of the show may be used for promotio surpases. Your badge is non-transferable and will be confiscot

CURRENT AND INCLUDE:

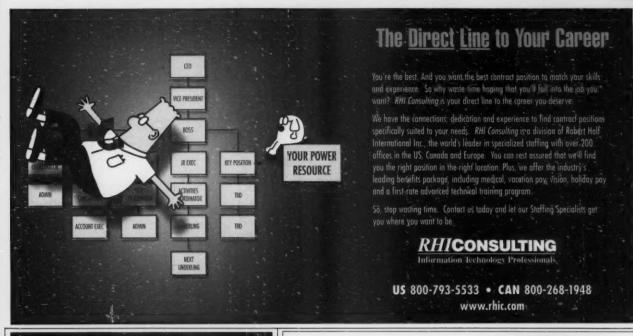
Avon Products BRM Associa Bluestone Booz-Allen & Homilton Burlington Northern Candle Corporation Cheyenne Software Chubb Computer Se Compaq Computer Corp. omputer Associates omputer Systems Devel oopers & Lybrand LLP CTG (Computer Task Group)

DotaSys
Depository Trust Co.
Dialogic Corporation
Disney On Line
Dun & Bradstreet
EDS

Eritex Information
Eritex & Young
Excel Communic
Gartner Group
GTE
IBM
IKON Office Information Builders Information Builders Ingersoll Rand Instinet Intel Corporation Judge Technical Lockeed Martin Lucent Technologies MCI Systems House Merrin Financial MicroAne MicroAge Microsoft Corporation Price Waterhouse

Price Waterhouse
PrimeCo.
Prudential
SHL-An MCI Company
Smith Barney
Software Quality Partners
Software Solutions
Software Spectrum
Source Services Corp.
Sprint Sypose, inc.
Tangent International
Technology Edge
Unisys Corporation
Vanguard Group
Variec Telecom
Volt Services Group

FOR EXHIBITOR INFORMATION, CALL 800-829-3976, EXT. 2940.





As the 1996 recipient of the prestigious Gartner Group "Excellence in Technology" Award, Capital One is forging ahead with revolutionary applications for IT. We have created one of the world's largest Oracle databases and are harnessing the awesome power of an information-based marketing strategy to explore new avenues for using IT.

- ORACLE DATABASE DESIGNERS
- ORACLE DEVELOPERS

We are looking for experienced Software Developers to join our Marketing and Analysis IT team to design, develop and implement these information-based strategies. We need your expertise to bring innovative business strategies from their conceptual stages to production-ready systems.

If you are eager to join a challenging and stimulating environment, fax your resume to: (804) 967-1483 or e-mail to: marystuart.gremer@capitalone.com. **Please reference job code EAD3CW17.** For more information, visit our Web site at http://www.capitalone.com.

Capital One is an equal opportunity employer.



www.capitalone.com

PREMIER 2 Oracle Sin beautiful South Florida

INFORMATION TECHNOLOGISTS

Average 80 degree temperature . . . sunny weather . . . beautiful beaches . . . vast cultural activities. If this does NOT describe where you are living, then you are not at the right place! Precision Response Corporation is not a consulting company - we work to deliver the best teleservices information in the business. Companies of all varieties know the value of outsourced teleservices. When looking for the best in the industry, they choose Precision Response Corporation. Our clients include leaders in the Fortune 500 who demand excellence in both products and services. To meet their challenges, we strive for constant innovation to improve our delivery system. Exciting integration techniques deliver quick, targeted information to our customers - techniques designed and developed by our elite staff of Information Technologists.

With our Client/Server infrastructure and continuous investment in the best tools available, PRC is where you can contribute on complex projects and see your ideas become leading-edge solutions. If you don't want to put on layers of clothes, shovel snow, or drive on ice slicked roads, yet want to utilize the latest in ORACLE tools, the time to make your move is now! We have openings in the following areas:

TELECOMMUNICATIONS - OPERATIONS

Environment is Lucent Technology: G3R PBX (Definity), AT&T Intuity, D53, T3, T1, TDAX, D5U/C5U, CMS/CAS, Conversant (IVR). Positions available are: • PBX Analysts • Telecom Managers



DEVELOPMENT

All positions require experience in the following: Oracle 7 X, Forms 4.5, Reports 2.4, SQL, SQR, Designer 2000, Developer 2000, RAD/JAD, advanced CASE tools. Positions available are: * Director of Development

- Sr. QA Analysts QA Team Leader QA Manage • Data Analyst

Work on tomorrow's solutions TODAY! Come join us and build your future with the leader in outsourced teleservices solutions in an industry that continues to grow. Please mail/fax your resume to. Technical Recruitment Director, Precision Response Corp., 1313 NW 167 Street, Miami, FL 33169, FAX (305) 816/2277. Or E-mail a plain, ASCII text file (MS Word) to: pguill@aol.com



Precision Response Corporation

INTEGRATED MARKETING SOLUTIONS

REGIONAL SCOPE

Iowa and Nebraska

These Midwest cities are new IS talent. Here's what they have to offer. EET YOU

desperate to lure, or create,

Low unemployment and cost of living, tall skies and cornfields, and wide open spaces. Information systems employment opportunities characterize the Midwest region that encompasses the metropolitan areas of Des Moines, Iowa, and Omaha and Lincoln, Neb.

The economy in the three cities is growing rapidly, salaries are competitive relative to the lower cost of living, and IS jobs across all major technology platforms are ripe for harvest. But before you plant career roots in these cities, here's what you should know:







MARKET SUMMARY

Dominated by insurance companies, Des Moines is a Cobol town in need of qualified programmers. Client/ server-related IS positions are less plentiful in the area. Major private-sector employers in the area include Allied Group (insurance), Amoco Customer Service Center (credit-card services), Blue Cross/Blue Shield of Iowa, Bridgestone/Firestone Tire & Rubber, The Principal Financial Group and US West Communications, Inc.

TOP IS JOBS AND SKILLS

Cobol application development, maintenance and migration; year 2000-related problem-solving.

BUSINESS CULTURE

Expect a 50-hour work week. Many entrepreneurial IS services firms are popping up, as local IS professionals leave full-time positions to contract themselves out at higher rates. "There's a stereotype that Des Moines is just a small farm community. But anyone who comes here knows it's just the opposite." — Kristin Solberg, IS recruiter. Executive Resources.

QUALITY OF LIFE

Strong family values area here. Moderate cost of living, slightly below the national average. Reasonable housing prices - a 1,500-sq.-ft., three-bedroom home ranges from \$95,000 to \$120,000, and the average monthly rent for a two-bedroom apartment is \$499. Good local school systems.

MONEY MATTERS

Local employers will generally offer a salary increase of 10% to 12% to attract new IS employees. But salaries overall are lower than in major metropolitan areas. Solberg says a certified Windows NT administrator could make \$47,000 to \$53,000 a year. Starting salaries for Cobol programmers are about \$35,000 a year.

GET GOING

c Greater Des Moines Chamber of Commerce www.dmchamber.com c Iowa Department of Economic Development www.state ia us/trends c Welcome to Iowa: The Smart State for Business www.smart.state.ia.us

MARKET SUMMARY

The Bureau of Business Research at the University of Nebraska at Lincoln estimates that in the fourth quarter of 1996, roughly 40% of the available technical jobs in the area went unfilled because of a lack of qualified applicants. Major private-sector employers include First Data Resources, Mutual of Omaha, Union Pacific Railroad, MFS Communications and Conagra, Inc.

TOP IS JOBS AND SKILLS

Client/server application development, migration and support; legacy application maintenance; telecommunications; electronic commerce; LAN/WAN administration: database administration.

BUSINESS CULTURE

A major technology park that supports private business and the University of Nebraska at Omaha will be completed by August 1999. It is expected to create 1,000 IS jobs in the next five years. The AIM Institute has been active in facilitating national IS recruitment, the development of client/server training and education opportunities, and local events for IS professionals.

QUALITY OF LIFE

Young professionals who seek an active singles lifestyle may not be attracted to Omaha. However, "Omaha was ranked one of the best cities for working moms, based on commute time, day care, quality of schools and jobs. So we have a great quality of life, but if you aren't from here or have never been here, Omaha is not a place that people think of moving to." - Vicki Meinhardt, vice president, First Data Credit Card Services Group.

Nebraska's average per capita personal income was \$23,208 in 1995. It has grown steadily since 1991, but it remains below the national average.

GET GOING

cBusiness Book Online www.businessbook.com c Access Omaha www.accessomaha.com c The AIM Institute www.omaha.org

MARKET SUMMARY

More than half of the technical jobs available in the fourth quarter of 1996 went unfilled because of a lack of qualified applicants, according to the Bureau of Business Research at the University of Nebraska at Lincoln.

Companies are strapped to find new talent to fill emerging and existing IS jobs. Major private-sector employers include Goodyear Tire & Rubber, Bryan Memorial Hospital, Gallup, Inc., Sandoz Pharmaceuticals Corp. and Transcrypt International.

TOP IS JOBS AND SKILLS

Client/server application development, especially C and C++, SAP and Cobol.

BUSINESS CULTURE

The city of Lincoln and the University of Nebraska at Lincoln have united to build the Nebraska Technology Park, a facility to support the growth of high-tech and manufacturing companies in the area. The food processing, pharmaceuticals, instruments and transportation equipment segments dominate local manufacturing. In the past 10 years, 30 new companies have moved into the area and more than 100 existing businesses have expanded.

QUALITY OF LIFE

Lincoln is the state capital, but it's also a college town, and the Cornhuskers rule. Homes cost about 10% less than the national average, and the crime rate, utility costs, insurance rates and Accra cost of living index are also all below the national average, according to the Chamber of Commerce.

MONEY MATTERS

See Omaha.

GET GOING

c Surf Lincoln! www2.surflincoln.com/lol c Bureau of Business Research www.bbr.unl.edu c Nebraska Department of Economic Development www.ded.state.ne.us

Goff is a freelance writer in New York.

WHAT'S YOUR GAME PLAN?

If you like to play to win, come play on our team. The Mutual of Omaha Companies have immediate openings for people with energy, ideas, talent, vision, and a desire to be on top of the heap. We're a Fortune 500 company and proud of it. We offer competitive salaries, family-friendly work life, a wellness center, flexible hours, great benefits, and, of course, lots of opportunity. Probably everything that fits in YOUR game plan.

Programmer/Analyst, Systems Analyst, Project Manager ...

Opportunities in multiple environments including COBOL, JCL, Visual Basic, C++, Client Server, AS400, IMS, Oracle, Modeling and Impromptu

Send your cover letter and current resume to:

MAIL: Mutual of Omaha Companies Information Services S-5 Human Resources Services 97-6500-OWH3297 Mutual of Omaha Plaza Omaha, NE 68175

FAX: 402-351-5031

(Attn. I/S Human Resources)

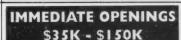
INTERNET:

IS_Human_Resources@mutualofomaha.com

Equal Opportunity Employer



Митиаь У Отана



COACH

unnilla.

OMAHA - KANSAS CITY MINNEAPOLIS TULSA - DALLAS - ST. LOUIS

- LS. Mgrs

· VP's

- Project Mgrs

CONTACT: Jan Isom NOLL HUMAN RESOURCES SERVICES 800-798-7736 ext. 3417 FAX: 402-334-2835

COBOL • AS400 • NPA • ORACLE • C/C++ • UNIX VISUAL BASIC • SQL SERVER • ASSEMBLER • DB2 CICS • LOTUS NOTES • DELPHI



Why Consult With

CTG?

As sure as the sun will rise, technical consulting with CTG is good for your career. If you've never consulted, or would like to do so again, this is your chance to shrine with a world leader in information technology services. You'll work with the latest technologies, add to your skills set and receive outstanding pay and benefits. Our Omaha office has openings by professionals with experience in any of the billowing.

· Full-Medical Benefits from Day One

- Averaging 9-12 Months · State-of-the-Art.
- Technology
 Learning Opportunities
- · Flexible Scheduling

now. · COBOL

* PROJECT MANAGEMENT

Brighten your career prospects with CTG. For consideration or more information, please forward your resume to: CTG, 2020 Dodge Street, Suite 404, Omaha, NE 68102. Fax: (402) 342-0165. Ph: (402) 342-0494. E-mail: ritomaha@sol.com EOE



Find training



Over 1000 Technical & Professional careers available on Omaha Careerlink

www.omaha.org/cworld

Visit our site today for exciting apportunities in:

APPLICATIONS DEVELOPMENT SYSTEMS ANALYSTS WWW DEVELOPMENT TELECOMMUNICATIONS

Systems Programmen SOFTWARE TESTING

NETWORK ADMINISTRATION Systems Integration

TECHNICAL PROJECT MANAGEMENT DATABASE ADMINISTRATION UNIX/COBOL/C PROGRAMMERS

With Growing-Companies like:



Visit Omaha CareerLink, contact our companies, & submit your resume online.



Applied Information Management Institute
1314 Douglas Ou-The-Mall
Omaha, NE 68102 www.omaha.org/cworld



Alegent Health



We are currently recruiting for the following positions within our Health System.

Security Administrator sess user needs to impent security procedures

Microcompute Analyst

DCS Windows 3.1

System.

Database

mainframe DB2, Oracle, SQL & Syb

Experience
Applications
(Junior/Analyst/
Senior)
Designs & developments ner
software applications
Project Management prefemant

Systems Programme CISI, DB2, General MVS Exp. Prefe

Please send or fax resume to:

Bergan Mercy Medical Center
7500 Mercy Rd.

Onabla, NE 86124

(402) 398-8166 FAX (402) 398-5539

IT CAREERS MIDWEST

Your Technical Expertise



While the appearance and performance of our automobiles are second to none, the genius behind their production is the work of our top-notch information systems professionals. They are responsible for the technical wizardry that drives our organization and has put us out in front of the competition.

When you take those cutting-edge innovations and put them to work in the world's most technologically advanced automobile plant...you've got one successful car company. So if this sounds like the challenging and rewarding environment you desire, follow the road to Mitsubishi:

➤ SYSTEMS ENGINEER I ◀

You will maintain, develop and improve cur maintrame computer systems while analyzing, designing, coding testing and implementing new and existing computer systems. Additionally, you will assist users in solving system problems as well as training them to use and document our system. So, in Computer Seriese, Sustainess or reliable field and not system. So, in Computer Seriese, Sustainess or reliable field and on a system So, in Computer Seriese, Sustainess or reliable field and on a significant system. Sustainess of the systems of the syste

➤ SYSTEMS ENGINEER II ◀

Ideal candidate will install, maintain, and improve our mainframe M&D M Series Payroll System as well as analyze, review and alter programs to increase operating efficiency and adapt no new user requirements. You will also train users on the system and provide technical assistance. B.S. in Computer Science or a related field with 4-5 years experience for a combination thereol) is required. Knowledge of software package maintenance and payroll is also necessary, as is a working knowledge of CoBOIL, COBO, 110, DBZ, VAMM, MYS JCL, TSOV ISPP. CICS, MSD BDDC, and Basytrieve. Knowledge of client/ server technology preferred. (Code: SEZ)

We will reward your contributions with a highly competitive we will reward your controlutions with a rightly competitive salary, full benefits, and a progressive, fast-paced environment. Please forward your resume with salary history and position code of interest to: Mitsubishi Mctor Masufacturing of America, fac., Atts: Personnel Administration, U.S. Route 150, Normal, IL 61761-8099.



Diversity is the Hub of our Success

Rapidly Growing Software Consulting Company

ZanaComp Incorporated is ... the premiere Michwest-based firm providing consulting services to an exclusive clientiels since 1989. We provide experienced professionals who architect, implement and support strategic business solutions. ZeraGomp specializes in Relations. ZeraGomp specializes in Relations. ZeraGomp specializes in Relations of Client/Server, Internet/Intranet Services and Data Warchouse technologies.

ZenaComp

ZenaComp

Incorporation

ZenaComp

Lincorporation

L

- recent accoldes are:

 Furtified Stilver Partner ZerusComp is one of the select members
 of the Informic Consulting Partner Program.

 Informic Academic Education Center The newly certified
 education center in the Midwigen Education Center Series Consultan
 ZerusComp is randed 20th on the Midwigen Perviote 190 List of
 the Institst growing, privately ledd companies.

 No worder ZerusComp is appareding assortment and is looking for
 very telenot. On ordered Center Series Consultans
 Servery telenot. On ordered Center Series Center

ZenaComp Incorporated is a great company to work with and work for! If your company is interested in Strategic Business Solutions contact Terry Brennan. If you are interested in Information on our Career Opportunities contact Kothy Chapman.

ZenaComp Incorporated
77187 N. Laurel Park Drive, Suite #351
Livonia, MI 48152
Phone: (313) 464-3700 • Fax: (313) 464-3730
http://www.zenacomp.com



PROGRAMMER/ANALYST

ACRO Service Corp. was recently recognized by the Detroit Neiwe in one of the top 100 fastest growing companies in Michigan. We are currently seeking the following IS Professionals for Fortune 500 Consulting assignments:

D82 DSA Multiple Opening: Minimum 3 years D82 D8A and IMS D8A or IMS/DC. Cross Platform D82-Oracle project experience and REXX preferred.

- MVS, DB2, IMS DB/DC, CICS, COBOL II
- UNIX System Adminis FOCUS/SAS/IBM MF
- VS/ACCESS/ORACLE/SQL/ Client Server

- VS/ACCESS/OMACLE/SQL/ Client Server C/C++/VISUAL C++/Windows WWW/ITHL/PRIL ORACLE DBA Forbran & C 5 years Embedded S/W Motorolo or Intel PC Support 9 SW Validation MAPPER + UNIC MASSM ESSBASE

Multiple openings in other 15 areas. Please Call.



17187 N. Laurei Park Dr., #165 Livonia, MI 46152 (313) 591-1100 Fax: (313) 591-1217 E-Mail: acrosvc.aol.com

SYSTEMS INTEGRATION MANAGER \$34.660 - \$49,222/Annually

Will perform responsible professional, technical and supervisory work in integrating of software applications and hardware through the entire process. which includes the development, design, implementation, training and management, for various City departments, Must have the ability to analyze various work processes and be able to integrate technical support. Must have extensive browledge of the uses and applications of modern deals processing equipment and of the operation and capabilities of installed software, burdware, peripheral equipment, and off programming techniques related to such devices. Requires considerable experience in data processing, computers and graduation from a college or university of recognized standing with major course work in computer science, business administration or related fields.

Applications and a complete job description: listing minimu qualifications are available from the Human Resourc Department, Snite 500, Orpheum Building, P.O. Box 447, Slo City, IA 51102-0447, or you may call (712) 279-6202. Deadline i completed applications including cover letter and resume in M.

Senior Programmer/Analyst: conduct business systems analysis and project initiation, initial surveys, feasibility studies and evaluation studies for trading applications, using NEXTSTEP technology and utilizing standard decision support tools and techniques; perform liaison function with management, audit users, consultants, vendors and operations; analyze and develop husiness swaters, and conversion designs developes about and business systems and conversion designs; develop short and

long range plans enabling the user to satisfy business objectives.

long inger pans chaoming the user to saussy obstiness objective develop and maintain project plans; lead projects and coordi-nate the project team including the work schedules and techni-cal and user activities. MBA in Business Administration and a Bachelor's degree in once in tossies southilistration and a bacterior's degree in Computer Science or Management Information Systems. One year experience in the position or three years experience as a Software Engineer &/or Programmer Analys &/or Systems Analyst. Experience in position and related occupation must include experience working with financial institutions and implementation of NEXTSTEP technology.

40 hrs./wk.; 8:15 a.m. - 5:00 p.m.; \$57,000/year. Must have proof of legal authority to work permanently in the U.S.

Send 2 copies of both resume and cover letter to Illinois Department of Employment Security, 401 South State Street - 3 South, Chicago, Illinois 60605. Attn: Dennis Jones, Ref # V-IL-16475-D. NO CALLS. AN EMPLOYER PAID AD.

Find training now.



Applications Engineer to develop portware for health & environmental professionais for use in regulatory compliance & information management, study for the property of the pr

1.3. Consultant (Systems Analyst): Utilizing est client server. Graphical User Interface (GUI) tools & and server tools develop, implement & integrate full libe tools & and server tools develop, implement & integrate full libe tools & and server tools develop, implement & integrate full libe tools & Good of the control of the control

Comp. Sys. Artyst. to design & write TMSS20XCv6 assembler lavel on the TMSS20XCv6 assembler lavel on the TMSS20XCv6 assembler lavel on programs with multiple channels for neel time control system data septiation. As play back & Visual C+-DLL code for high level application of the time of time

are a BA, BS, or BBA in computer systems, in yet experience or management computer systems, in yet experience on female, in yet experience of the computer systems and the computer systems are systems and distribution related billing services. Experiences may be simultaneous. Experiences may be simultaneous. Experiences may be simultaneous. Experiences may be sometimental to relate the complex of the Chicolity. First-SALC. P.O. Box 1972; Madison, VM 63707-7972. Residence File C100014. Sftwr Engineer: Analyze user/functional reg'ts & development of the state of the st

South-eastern Wisconein printer of magazinas and catalogues seets programmer/analyst. Outer programmer/analyst. Outer programmer/analyst. Outer programmer/analyst. Outer production systems in both DEC cand Window platforms utilizing Powerbuilder to create connection DEC environment. Analyse, devel-op and refine systems to be utilized in wearbouse enventory and distrib-sine a RA, BS, or BBA in computer science or management computer science or management computer.

#1666-96. Employer Paid Ad.

Systems Engineer, 40 hrs/wk,
am-5pm, \$46,000/yr. Analyze,
am-5pm, \$46,000/ Systems Analyst (Fort Worth, TX). Design, dev. & implementation information management computer systems in NATU-RAL under ADABAS database employing IMS, CO-BOL & SAS. 40 hrs.wk. \$50,000/yr. 2 yrs. exp. in job offered. Send resume to Marie L'Esperance. COMSYS Technical Services, Inc., 4000 McEwen South, #200, Dallas, TX 75244. Re: Position #3956.

Software Engineer (Dallas, TX), 5 Positions, Analysis, design & adminis, of ORACLE PDBMS, using ORACLE DE-VELOPMENT TOOLS, SOL SERVER & C language, 40 hrs. vike. Review of the Comp. Eng., Math. Ochris. Sci., Comp. Eng., Math. Ochris. Comp. Eng. Sci. Comp. Eng., Sol. Comp. Eng. Eng. Comp. Eng. Comp. Comp.

COMPUTER PROFESSIONALS

DUE TO OUR CONTINUOUS GROWTH, WE HAVE EXCELLENT CAREER OPPORTUNITIES FOR COMPUTER PROFESSIONALS INTERESTED IN LITILIZING THE MOST CUTTING-EDGE TECHNOLOGIES AVAILABLE.

WE DEED COMPETITIVE MY CONTINUING TECHNICAL EDUCATION AND FLEXIBLE HOURS IN A CASUAL BUSINESS SETTING.

DATABASE ADMINISTRATORS

Seeking individuals to do performance tursing, support application efforts and perform system configuration. Requires 2 years experience in Microsoft SQL Server or DB2

COBOL COBOL COBOL COBOL COBOL COBOL

Flyou know C09DL we want to talk to you! I Opportunities exist to cross-train in Yssul Basic. Individuals will work in teams supporting our core businesses including: inventory, france, sales, occurring, EDI and many others Care requirements include: ""CIS" "DBZ "YSAM" "MYS/UC. Environments are: BMI 3090 or AS/400

SENIOR VISUAL BASIC PROGRAMMERS

Fast-paced teams will do RAD development, meet with internal customers, develop S/W to fit business needs. We are currently betr-testing VB 5.0 Requires 2+ years experience in Visual Basic and MS Access along with excelle

C++ PROGRAMMERS

Hiring C++/Visual C++ Programmers to work in eminorment utilizing MFC, Windows NT, & 00 Techniques. Requires strong C++ or Visual C++, Unit, Oracle, or SQL experience. Data warehousing background is a plus.

IF INTERESTED, PLEASE MAIL OR FAX RESUME TO:

Marguerite Zack, MIS Recruiter Best Buy Co., Inc. P.O. Box 9312 lis, MN 55440-9312

FAX: (612) 947-2005

sthery.com Bust Bur Joe Horune: (612) 947-2555 portunity/Doug-Free Employer©1997 Best Buy Co., Inc.

100 Best Places to Work Annual Issue Date: June 1997 Close: May 13, 1997

CALL 1-800-343-6474 x8000



Be a part of a team developing

Experienced IS Professionals:

DSS/Database Analyst

- Informix or related database State and Bureau reporting
- Continued analysis and design of the Decision Support

Claims Programmer Analyst

- System. Client Server development P&C Claims
- Analysis and design of client server based claims system

- Business Analyst

 Object Modeling/Development
- Documentation
- Project Analysis/Design
- **Programmer Analyst** COBOL, Access, Delphi
- 2000 conversion and transition

systems to client server Quality Assurance Specialist

- Unit/Regression testing
- Software Development

ase Specialist

- PC file management
- PC software version control

If you desire a dynamic working environment, have experience and the desire to excel in a company dedicated to personal & professional growth. please forward your resume with cover letter and salary history to:

With current technology trends turning to Client Server, Relational Databases and Object Oriented Methodologies, can you

Berkley Information Services is a growing, progressive property & casualty insurance service provider. We develop and service computer software for the regional insurance companies of the W.R. Berkley Corporation.

afford to overlook our opportunities?

Our technology includes: Delphi, NT, Informix, UNIX, HP9000, COBOL and Internet.

We offer the opportunities associated with being a part of a large, focused and empowering corporation, the security of small town living, the convenience of being approximately 30 minutes from Sioux Falls, SD and a personal working environment. Additionally, we offer a casual dress code, flexible work week options, a competitive compensation & benefits package, and a real opportunity for motivated and talented individuals to gain the recognition and compensation that they deserve.

Berkley Information Services

EOE

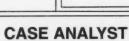
An Information Technology Firm Permanent and contract positions are currently available throughout the Southeast. Any and all skills are of interest to us:

· CLIENT SERVER · MAINFRAME · MIDRANGE

Excellent compensation and benefits, training, relo. assistance, and 401-K. Call or write today: Software Data Services, Inc., 4600 Park Road, Suite 109, Charlotte, NC 28209.

PHONE: (800) 521-8077 or (704) 521-8077 FAX: (704) 521-8078

http://careers.computerworld.com



needed for large client/server application development project targeting DO: Windows, and MVS operating systems on PC and Mainframe platforms. Applicants need 8+ years programming exporience in COBOL, C++ and 2+ years full life cycle development with COMPOSER IEF with GUI preferred. Need proficiency with IEF encyclopedia and familiarity with MVS, MS-Windows, OS/2, DB2, DB2/2 and VSAM DBM's.

Send resumes to EBSCO Industries, P.O. Box 1943 Birmingham, AL 35201 or fax to 205-991-1164 or email to SHK@EBSCO.COM.



Programmer (Mechanical) to develop complete proprietary mechanical application software for image processing from the programment of the proprietary mechanical applications of the programment of the property of the proprietation of the programment of the progr

Computer Operations Manager manage computer operations groups moved with the ASY 400, Unisys V Series & Tlandsem hardware and fine Tandsem & OS/400 operating systems; direct and coordinate activities of 46 computer operations and obtained to the computer operations and outcome deadlines that all unifies the ensure accurate and timely delivery of computer products; develop department goals and promises; participate in planning for mee hardware installations; problem resolution; support the implementation, procedures, updating and testing of back-up dating and testing of back-up dating and testing of back-up when the control of th problem resolution; support the implementation, procedures, procedures, updating and testing of back-up disaster recovery plants; evaluate software & hardware and data processing projects to distermine usefulness and compatibility, lighters with support the property of the projects of data processing projects to disternine sizelliness and compatibility, lisison with partners and clients to resolve product problems and ensure smooth implementation of new systems installations; hire, train and supervise competer beardishs, beating to the position or 5 years as a Competer population or 5 years as a Competer population of 5 years as a Competer of 5 years and 5

Programmer Analyst - Plan, develop, test & document Conclute programs, applying incoveedge of programming technologies & computer systems; explainable user request for new or moditted programs, determine feasitied programs, determine feasipatibility with current system &
computer capabilities; consult
with user to identify current operaring procedures & clarify program objectives; formulate plan
gram objectives; formulate plan
gram objectives; formulate plan
gram objectives; formulate plan
gram objectives; formulate plan
grams usualisms and programs of the program objectives; formulate plan
grams and programs and programs of the program objectives; formulate plan
grams and programs are programs and programs and programs are programs and programs and programs are programs and programs and programs are programs are programs are programs are programs are programs and programs are programs are programs. ating procedures & clarify program objectives; formulate planoutlining steps required to develp program using structured
op program using structured
op program using structured
op program using structured
of detailed instructions & logical
optimized processable by computer; Interded responsibilities include using
optimized processable by computer; Interded responsibilities include using
awide variety of hardwares, softwares & languages including, but
wide variety of hardwares, softwares & languages including, but
wide variety of hardwares, softwares & languages including, but
wide variety of hardwares, softwares & languages including, but
wide variety of hardwares, softwares & languages in Computer Infland and the Computer Science,
Systems Analysis, Computer Infengineering, Electrical Engineering,
Electronic Engineer,
Indiana Structure,
Indiana Struct nt, Accountant/Programmer latyst or Auditor/Trainee Prog-mer. Will accept 3 yrs. college ucation plus 3 yrs. exp. in the offered in lieu of the required & exp. 1 yr. of the exp. in the offered or related occup, must job offered or related occup, must include using each of the following: IBM PC, 3090, MVS/TSO, ISPF, DB2, IMS, VSAM & COBOL, III. \$32/hr, 40 hrs/wk. \$30e.5p. Mr. Sand resume to 7310 Woodward Avenue, Room 415, Detroit, MI 48075. Include 1848 152/93. Employer Paid Ad.



Omaha's got it all. A thriving city with small-town charm. Recreational activities galore. A low cost of living. And, of course, some of the most challenging and rewarding career opportunities in the field of information sy

MemberWorks Incorporated", one of America's inember/vorisi incorporated , one of Americas leading designers and providers of innovative membership service programs, is proud to call Omaha home. And you will be, too. Besides being a great place to live, Omaha is a growing center for high-tech. Member-Works¹⁷, in fact, is one of the fastest growing companies in the U.S. Currently, we're seeking energetic information systems professionals, with AS/400 RPG, DB2 and Client Access experience and the drive to keep us moving forward, in the following positions:



- Programmer/Analysts
- Sr. Programmer/Analysts
- Project Leaders

With competitive salaries, excellent advancement opportunities, and an attractive benefits package, MemberWorks²⁴ and Omaha offer the perfect environment to grow your career. For imme consideration, forward your resume to: 11165 Mill Valley Road, Ornaha, NE 68154. Fax: (402) 493-8297.







Programmer Analyst to cus-tomize & integrate CAD data management s/ware, enhance CAD data management s/ware for world-wide customer support. ror world-wide customer support, implement enterprise-wide data model, develop backup tools for data models, develop backup tools for data models, develop backup tools for data models, develop user interfaces for product information management alware, access & integrate legacy PDGS-EDGS data: store/rotrieve any design/drawing information in. legacy PDGS/EDGS data: store/ retrieve any design/drawing information to any supported Data Manage Systems; s/ware programming, system design & analysis, debug, integration test-ing, document review, technical consultations & discussions; interact with product & develop-ment support groups to obtain analysis, debug, integration test-ing, document review, schmical consultations in Scausaions: interact with product & development of the consultation of the consultat

Systems Engineers

DIC Group, specializing in the pre-Manufacturing solutions beilt are CADICAM product, CASSA. At the

TCP/IP, C++, Or

We offer an excellent compensation package include Medical/Dental insurance, 20 days paid weather a vehicle for the appropriate people. For confidential optesse send resume and salary history to: 18mmas DEE/CE face, 900 Wilshire Drive, 2214, Frey, MI (810) 362 2841. Equal Opportunity Employer.

DIEICIS An I|D|C Group Company



So, you think advancing Information Technology for the transportation industry doesn't sound all that stimulating? Think again. At CSX Technology in Jacksonville, we're strictly cutting-edge. In fact, Computer World placed us among its international "Networking 25," selected as the most outstanding and innovative of all companies pushing the limits of global technology today.

Profiled in several leading IT publications for work done with Java, HTML, C, C++, OO Design and CORBA, CSX Technology can provide professionals exposure to the latest technologies and techniques for top-drawer software engineering. We emphasize strategic alliances with IBM, Microsoft, Netscape, Oracle, Sun and AT&T and foster a collegial, delivery-oriented work atmosphere.

Get involved in the custom development of internet and intranet applications. Implement and customize leading edge software packages such as Peoplesoft and Oracle products on an enterprise-wide scale. Whatever the project, CSX Technology understands the career of the IT professional, and offers both managerial and technical career paths filled with exciting opportunity for development. Our varied customers include all CSX business units with both national and international clientele.

Having experienced double-digit growth over the last 5 years, CSX Technology possesses stable leadership and dynami success and offers highly competitive compensation and bonus



programs. To learn more about us and our career opportunities, contact us at: 500 Water Street-J400, Attn: Employee Relations Manager, Jacksonville, FL 32202, or review current opportunities at www.monster.com, EOE

STABILITY GROWTH / FINANCIAL STRENGTH

TECH SUPPORT MANAGER.....25% BONUS POOL.....75K+ Mng Desktop / Server activity for co., with NT, DOS, UNIX op sys knowledge. Novell, LAN's, WAN's, TCP/IP. 8-10 yrs exp.

NETWORK IMP MANAGER......VP OPPOR......70-100K+ WAN, HUBS, C/S in 7x24. Network sys install, IBM, Tandem, DEC & UNIX, 6+ yrs exp.

CALL CENTER ARCHITECT.....LEAD TECH......70-100K PBX, ACD, IVR and CTI expertise for design & development

DRAPROGRAMMER ANALYST ... VISIBILITY/RECOGNITION 40K Cons. w/development & bus. units on design, devl. of all SQL DB engines, i.e., Sybase, Oracle, MS SQL.

PROJECT LEADER.....GROWTH/LEADERSHIP......50-70Kyears exp. in progressively more technical programmer analysis, sys-is design & implementation. Knowledge of business operations, finan-cial services. High level relational database skills.

APPLICATION DEVELOPERSCLIENT SERVER.... DOE

Please Contact: Lisa Loveland / Lee Nightingale at 7) 367-9200 phone or (617) 367-4906 fax Positions, I 1 Faneull Hall Marketplace, South Market, 3th Floor, Boston, MA 02109

INFORMATION TECHNOLOGY SPECIALISTS

Sales Engineer wanted to interface with & supply tech. data to development engineers to development engineers to assess suitability of develop, libraries of the sale of the engineers of the eng of software tools; evaluate cus-tomers' systems regts. & suggest appropriate software & hardware; educate customers in comp, edu-ption, concepts. & IVR applica-tion uses of telephony; integrating software with various telephony hardware components, as well as existing PBX systems; interface with software development engi-neers to communicate customer enhancement. & application with software development engineers to communicate customer neers to communicate customer develop, requests, Must have a Bach, degree in a Comp, related field & 2 yrs. customer service or sales exppr. providing high level tech. support to software engineers of the software engi

GATX Logistics Inc. is an industry leader in providing integrated third party logistics solutions. We provide value added services for a wide range of wavehousing, puckaging, transportation and inventory management needs. Our ever growing customer base encompasses over 100 facilities throughout the U.S. Conado and Mexico.

Our Information Systems professionals enjoy the exciting challenges of a dynamic environment in the high growth logistics industry. Customer success is driven by our Project Managers. These managers enjoy a wide growm logistic industry, Lustomer success a curven by our roper Amonges, misse manuges emply a wave ronge of responsibilities, from monoging the customer relationship to coordinating, implementing and financially monoging the system project life cycle. Our infrastructure of AS/400's, RS/6000 and Intel platforms provides the opportunity for Application Developers and Technical Service professionals to utilize many skills. A number of software tools including AS/400 Synon/ZE, Obsydian, C/C++, and Lotus Notes are utilized to offer comprehensive logistic system solutions. The information exchange is streamlined through the use of EDI. In addition, comprehensive training, documentation, and 24 x 7 help line support are provided to meet our customers' needs.

Our continued success has created immediate career opportunities in the following areas:

TECHNICAL ANALYSTS

AS/400 • Telecom/WAN • LAN/PC

SYSTEMS SUPPORT MANAGER (Help Line)

APPLICATIONS DEVELOPMENT

EDI Professionals • Synon /2E • Transportation • Development Leads Senior Systems Analyst (System Architect) • Strategic Systems Peoplesoft/JDE Programmer • Client Server

We offer an excellent salary and benefits package and the apportunity for growth. If you meet these requirements and possess a positive, professional and flexible demenant in dealing with customers and team work, and the ability to be proactive in a customer-responsive warehouse environment, please forward your resume and salary requirements to: GATX LOGISTICS, INC., Staffling, 1301 Riverplace Boulevard, Suite 1200, Jacksonville, FI. 32207 or Fax: (904) 396-5647 or e-mail: siookmen@interremp.com (NO PHONE INQUIRIES OR RECRUITERS). Equal Opportunity Affirmative Action Employer M/F/D/V



Systems Integrator

You must be a proven applications programmer/analyst for our rapidly changing environment in personal lines insurance. We are seeking a self-starter who works well indepen-dently and in a team environment. Responsibilities include project analysis, design, coding and implementation, working hand-in-hand with the internal user community. Additionally, you will be assigned various tasks for maintaining our existing systems. You will be an intricate part of a team faced with the challenge of re-engineering applications for the Year 2000 initiative. Minimum 3 years' IBM COBOL, COBOL II, JCL, Project Leadership, MicroFocus COBOL, Client Server experirance Application background desirable BS/BA required.

Client/Server Developer

C, Visual C++, HTML, UNIX, Visual Basic, Easel, Sybase/SQL, Win, 3.1/NT, Client Server and Web development. Position requires high energy self-starter who works well indepen-dently and in a dynamic team-oriented environment. A suc cessful candidate will be involved in many fast-paced development projects as well as the maintenance of our existing pro-duction client/server applications. 3+ years experience desired. BS/BA required.

At Electric Insurance we offer state-of-the-art technology highly competitive salary, and an outstanding benefits package. If you are looking for an organization where your ideas can make a difference, please send your resume and salary requirements to: Electric Insurance Company, Dept. IT, 152 Conant Street, Beverly, MA 01915; Fax (508) 524-5226:

Electric Insurance

SENIOR BIOS ENGINEER to design, develop and maintain ISA/EISA/PCI BIOS and utilities using 80x86 kasenshly larguage maintain ISA/EISA/PCI BIOS and utilities using 80x86 kasenshly larguage particular programme of the processors: Analyze, design, maintain and customize Server Internation and International Server International Control of the Internation of the International Control of the International

SOFTWARE ENGINEER: Ability in Dealgring and modeling of Relational database systems: Proven ability in System Administration in SYBASE: SYBASE





Issue: October 31, 1997 **Advertising Deadline:** September 17, 1997

-800-343-64

Lotus Notes Professionals



Prudential is America's largest insurance company and a world leader in financial services. Currently, Prudential's Groupware Services has exciting opportunities available for Lotus Notes professionals to join our rapidly expanding team in NORTHERN NEW JERSEY. Prudential Groupware Services is responsible for implementing and supporting Prudential's Groupware Standard, Lotus Notes.

Level 3 Support

You will be responsible for problem determination and troubleshooting notes in a 20,000+ user environment. You should have in depth knowledge of notes versions 3 & 4 including server administration, replication, mail routing, intel based servers, Microsoft NT, TCP/IP, Token Ring, Ethernet. Good communication skills and the ability to work in a fast paced team environment are required.

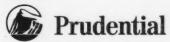
Projects

You will be responsible for the implementation of notes related projects. These projects are part of an initiative to roll out Lotus Notes as a standard on 60,000 desktops. This includes domain consolidations, CC Mail, MS Mail and Profs conversions. You should have a working knowledge of notes versions 3 and 4, including server administration, and applications develop-ment, Microsoft NT, multiple protocols. Excellent oral and written skills, and the ability to adapt to constantly changing demands are required.

Applications Development/Support

You will be responsible for troubleshooting application design problems and working with developers to deploy applications throughout the Enterprise. You should have an in-depth knowledge of notes versions 3 and 4 application development and a working knowledge of notes administration including replication. Excellent oral and written skills, and the ability to work in a fast paced changing environment are required.

Prudential offers competitive salaries, a comprehensive benefits package, and opportunities for advancement. For immediate consideration, please call or send your resume, indicating position desired, to: Comtex Systems, Dept LN97, 30 Two Bridges Road, Suite 330, Farfield, MJ 07004; Fax (201) 575-9759, Phone (201) 575-9726 or 9728, e-mail:



We are an Equal Opportunity/Affirmative Action Employer and are Committed to Diversity in Our Work Force.

An established international information technologies firm founded in 1985 is expanding, Immediate hire apportunity for talented, self-mativated professionals with

PRISM Consulting Services, Inc

SENIOR SOFTWARE ENGINEER to design, develop, implemental control of the control

Get Stuck on Technology, not in Traffic

PORTSMOUTH, NH

BEVERLY/DANVERS, MA

A brighter future is closer than you think. The choice is yours. Whirk at our Corporate Data Center in the beautiful seacoast town of Portsmouth, NH, or our Massachusetts Development Center conveniently located just off Route 128 in the Beverly/Darwers area. Either way, Liberty Mutual I/S offers you the opportunity to design and develop cutting edge basiness applications in an object-oriented, client/server environment. Increase your overall skills by working beside the most technologically advanced individuals in the country. Liberty Mutual I/S dedicated to effectively applying leading-edge technology to the development of business solutions from customers and our company. We offer a remarkable opportunity, one that can provide you with the challenges, growth, experience and lifestyle you with the challenges, growth, experience and lifestyle you with the challenges, growth, experience and lifestyle you with the challenges.

Project Managers/Project Leaders

Coordinate the analysis, design, budget, technical resources and accuracy of 1/T projects. Lead multiple projects involving data warehousing in an OO client/server environment (Sybase/DB2 preferred). Experience with Wintel desktop, midrange, and/or mainframe systems preferred.

Client/Server & OO Developers

lesign, develop, test and implement OO client server systems. Experience with object oriented tools & methodologies distributed objects and 3 tiered architectures Visual C++, VB, MPC, CORBA, MQ, C++/UNIX, Booch/Rumbaugh, cobson, OMT, RogueWave, Snif+, Win95/NT, RS6000-AIX, HP-UX.

Database & Technical/Programmer Analysts

Data modeling, application development and support in an OO client/server, mainframe environment. Experience in one or more of the following areas: Win 95/NT, 4D, UNIX/Sybase, Cobol, or MVS/IMS/DB2. Data modeling tool experience preferred.

Software Test Leaders/Analysts

Assist in the development, implementation, and management of test plan activities for a release. Define test cases/scripts, recommend test tools, execute test analysis/debug and optimize performance. Experience with Purify, Pure Coverage or QA Partner preferred.

Business & Data Analysts/Architects

Structure and model shared data requirements and designs. Experie ing tools (Silverrun or Rational Rose preferred). ce with data modeling, data flow and object model-

Desktop/Networks/Telecom Support Services

Implement and support desktop migration, inter-networking technologies and telecom systems utilizing the newest tools and technologies on Win 95/NT, R\$6000-AIX, MVS mainframe systems. LAN/WAN, CSU/DSU, PBX experience

If you re ready to accept the challenges of one of the positions listed and change your lifestyle/workstyle for the better, send your resume to: Bill Hickmott, Liberty Mutual US, 225 Borthwick Avenue, Portsmouth, NH 03801. Fax: (603) 431-4709.

Liberty Mutual Group is an equal opportunity employer committed to workforce diversity.



The freedom of Liberty



Help the human race. Win the technology race.

Our custom solutions are revolutionizing the way consumers shop. Helping make our highways safe. Speeding the transmission of lifesaving medical information. Symbol Technologies—because technology is only as impressive as what you can achieve with it.

Play a key role in the maintenance, security, data integrity, performance, and capacity planning of our corporate IS Oracle? database servers, which reside on HP9000s. We'll rely on you to install and upgrade the Oracle? server and application tools and ensure that we maintain acceptable levels of database performance and maximum production availability to end-users. Your impact will extend to physical and logical security of data facilities and system data; operations staff training in the areas of database backup and recovery; and capacity analysis of applications developed with PowerBuilder. In addition, you'll handle system administration activities. To join our team, you must have a BSCS or equivalent experience in information systems management within a multiple-CPU networked environment. Your qualifications also must include at least 4 years of progressive systems hardware/operating system application experience on the HP/UX platform and 3 years in data communications.

These two openings offer you the opportunity to advance your expertise in designing and programming enhancements to systems that support our customer service functions. Your role in our success also will involve documentation and ongoing support of the systems. To meet the challenges of either position, you must have a BSCS or the equivalent, a command of SQL, and excellent written and oral communication skills. Your experience must include at least 3 years of programming in a relational database environment; 2 years of work with PC or client/server applications; and 2 years of work in a UNIX environment. Oracle, Sybase, MS Access or Visual Basic. HP-UX, and HP MPE expertise is preferred, as is a background in a customer service or support environment. In addition, one positive requires at least 2 years of C programming experience.

We have two openings for Programmer Analysts in our Information Systems Department. Both positions will be responsible for the design, development and implementation of various systems that support our technologies, and prepare documentation for systems design, requirements and programming specifications. We are seeking candidates who possess a SSCS or equivalent and 3+ years IS experience, some of which must have involved programming. While one position will require knowledge of FORTRAN programming language, the other will require a solid working knowledge of SAP and Oracle as well as superior communication skills. Knowledge of other 4GL software as well as PC and LAN experience helpful.

There has never been a better time to make the move to Symbol. In addition to the excitement and challenges associated wi There has never ocen a octure time to make the move to symbol, in addition to the excitations and challenges associated with joining a rapidly growing and successful company, you'll receive relocation assistance, a competitive salary and benefits package which include a 401(k) plan and an off-site day care facility. For immediate consideration, send/fax your resume with salary requirement, indicating position of interest, to: Human Resources Dept. TP, Symbol Technologies, Inc., One Symbol Plaza, Mis-Bes, Holtsville, NY 11742-1300; Fax (516) 738-3814. For more information, visit our Web site at: http://www.symbol.com An equal opportunity employer m/f/d/v.



HRIS Consultant

112

Truly Innovate. You can't do this anywhere else.

This is how GI Communications, a division of General Instrument Corporation came to pioneer digital compression, partner in the introduction of direct-to-home digital satellite systems, and introduce cable phone telecommunications products. We are now the world's number one provider of analog and digital cable and satellite TV, high-speed data, and switched digital access systems. And our rapid growth to a \$1.7 billion division combined with continual technological advancements in the delivery of voice, video and data has created new opportunities:

In this position, you will consult with our Human Resources and Payroll Department on all systems requirements. We'll rely on you to monitor the system needs and enhance the system with new software, applications, and hardware. You will leverage intranet technology for expanded interactive HR applications, i.e. benefits enrollment, recruitment, training, etc. You will also provide technical quidance to users.

For consideration, you will need at least three years' HRIS (Windows environment) experience including knowledge of HR processes, HRIS software customization, and strong analytical skills. A background with sophisticated interactive technology (web site development) desired. Bachelor's degree in Computer Science or Information Systems is required.

Here's how to apply.

In the suburbs of Philadelphia, GI offers highly competitive salaries and comprehensive benefits. Learn more about us on the World Wide Web at: http://www.gi.com

For consideration, please send your resume to: General Instrument Corporation, GI Communications Division, Employee Resources Department/ER001-LE, P.O. Box 697, Hatboro, PA 19040-0697. An Equal Opportunity Employer,

@ General Instrument

Systems Analyst - SALARY:
\$41,000.00 per year. HOURS:
\$40,000.00 per year. HOURS:
\$500 am. to 5:00 pm., 40 hours
per week. JOB DUTIES: To analyza user requirements, proceper year. JOB DUTIES: To analyza user requirements, proceprocessing and to improve computer systems by designing and
administering distibase-Oracle raDEC Aloha Con VMS or IBM
S-6000 AIX using ORACLE
CASE. ORACLE FORMS and
ORACLE SCHOPTIS. To network
of DEC Aloha Con VMS or IBM
S-6000 AIX using ORACLE
CASE. ORACLE FORTIS in network
sarver environment using ORACLE SQL-MET with TCP/IP SPV
IPX, NetBIOS and Named Pipes
protocol and to do programming
protocol and to do programming
PU/SQL EDUCATIONAL RECEQUIREMENT. Must have Bachisions degree with a major inCentrology. EXPERIENCE
REQUIREMENT: The two years
experience in job offered or as
software or programmer analysis
should include work using statis
FORMS and ORACLE REPORTS and ORACLE PROOR ALIBRIA ALIBRIA GA. Apply only by
sending resume to: Georgia
Department of Labor, Job Order
Hills Road, Affairla, GA. 303293909 or the nearest Department
of Labor Field Service Office.

Manhattan Associates, the leading, supplier of warehouse management software, has openings in Atlanta or AS400 Systems Developers and Programmer Analysts. Lead Systems Developers and Programmer Analysts. Lead Systems Developers and Programmer Analysts. Lead Systems Developers and Lead team oping, coding, and testing were house management system utilizing RF and barcode seaming technologies on AS/400. Requires Meaters or equiv. and profilectory in design of the systems and processes in accordance with pathologies of the systems and the system systems and processes in accordance with a system systems and the systems and processes in accordance with a system systems and the systems and the systems and the systems and evelop client server based system utilizing radio frequency technology and enfanced system functionality a

Walker Systems Consultant.
Responsible for analyzing, designing and implementations, designing and implementations of the consultant of th

Systems Analyst - SALARY:
\$42,000.00 per year. HOURS:
8:00 a.m. to 5:00 pm, 40 hours
8:00 a.m. to 5:00 pm, 40 hours
8:00 a.m. to 5:00 pm, 40 hours
and problems to automate prosand problems to automate prosand problems to automate prosand software applications using
Accommodate applications to J.D. Edwards
systems. EDUCATIONAL. REPROCEEN FLOW STATE AND ACCOMMODATE
PROCEEN TO STATE AND ACCOMMODATE
PROCEEN TO STATE AND ACCOMMODATE
PROCEEN TO STATE AND ACCOMMODATE
ACCOMMODATE AND ACCOMMODATE
ACCOMMODATE AND ACCOMMODATE
ACCOMMODATE AND ACCOMMODATE
ACCOM

Labor Field Service Office.

International Product Consultant (2 positions). Provide technical support to management and assess staff of company in selling the company's CABS2000 customer care of company's CABS2000 customer care of company's CABS2000 customer care of company's CABS2000 customer care and billing systems. Perform: regularements and the CABS2000 customer care and billing systems of the CABS2000 customer care and billing systems. Perform regularements care concernation of the CABS2000 customer care and billing systems of company co

Hd., Ste. 460, Allanta, GA 30341.

Software Engineer (DOT Code
Software Engineer (DOT Code
Software Engineer (DOT Code
Software Code
Software

Programmer/Analyst (Variable job sites in New York/ New Jersey/Connecticut). Management design & programming of client-server/relational database applications software in SAP R/3 BASIS under ORACLE, RDBMS in AIX ORACLE, RDBMS in AIX operating environment. Req. Bachelor's in Comp. Sci., MIS or Elec. Eng. & 1 yr. exp. in job offered. \$70,000/yr. 40 hrs./wk., M-F, 9-5. Send resume to Linda Rowan, Target Resources, Inc., 124 Partrick Ave., Norwaik, CT 08851

SAP DATABASE ADMINISTRATOR

The selected individual will design, develop, administer Data Management policy and achieva. Develope management operations are provided to the property of the provided property of the provided provide

MedPartners, Inc., offers a competitive benefit program and oppor-tunities to grow and develop in a dynamic industry. Interested appli-cants are encouraged to flux resume and cover letter, please speci-fy the position you are applying for, to: FAX 205-982-7701 Attn: JM



Barnes & Noble BOOKS BY MAIL

the highly successful book/catalog company located in Northern New Jersey (bordering Bergen/ Rockland Counties) is seeking the following professionals:

OPERATIONS & APPLICATIONS SUPERVISOR

OPERATIONS & CAPPLICATIONS SUPERVISOR
The hands-on Supervisor we're seeking will oversee the computer operations of our direct mail business which includes heavy systems support to all Operations. Catalog Production, Financial and Merchandising areas. Candidates must possess a minimum of 3 year's supervisory experience in HP 9000 MFE/OC environment. PC experience and some programming is helpful. Direct Mail background, LAN experience and familiarity with any of the following image Dasabase, QUIZ. Supervol, MACS (Mail Order and Cataloging System) and COBOL.

COBOL PROGRAMER

Candidate will possess a minimum of 4 year? COBOL programming in HP 3000 MPE/OX environment, with project planning and execution responsibilities. Excellent communication skills are key. Direct Mail background and familiariny with Image Database, Supertool, MACS, (Mail Order & Cataloging Systems) or QUIZ a plus.

We offer a great benefits package that includes medical, dental, 401k and unition reimbursement. Qualified candidates should send/fix resume (please indicate job of interest) which MUZI include slaspy history, to Director of Human Resources, Barnes & Noble Books by Mail, One Pond Road, Rockleigh, NJ 07647. Fax: 201-767-6638. Equal opportunity employer M/F.

Find training now.



ssue Date: June 1997 Close: May 13, 1997

1-800-343-6474 x8000

OUR STAFF MAKES US #1, WE NEED YOU TO KEEP US THERE!

We have immediate openings in Phoenix, Arizona for highly motivated and career oriented consultants with at least 2 years experience in one or more of the following:

MAINFRAME

- · COBOL
- · IMS
- · CICS

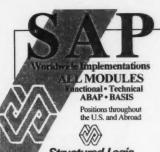
- Vissoft Year 2000 Toolset IMS and/or DB2 DBA Banking/ACH /COBOL
- DISTRIBUTED/CLIENT-SERVER
- Sybas Oevelopers Java/CGI/HTML
 Visual Basic and/or
 PowerBailder, SQL
 Informix

- Windows NT Help Deak Support
 Unix Systems Administrator

PLEASE CALL, MAIL OR FAX RESUMES TO:

Professional Software Consultants, Inc. Paul Rosenthal

4747 N. 7th St. #424, Phoenix, AZ 85014 (800) 279-4498, Fax (602) 279-1161 prosen4192@aol.com



Structured Logic Company 1975 North Park Place

Atlanta, GA 30339 800/599-9550 770/955-1714 FAX: 770/937-0423 e-mail: slc11@aol.com

MEMBER NACCB



(King County Washington

NETWORK MANAGER

NOZ./UUI-3/ S.JUUI/YEAR

Plan, staff, manage & coordinate the business & technical services in the areas of Wide Area Networks, distributed computing, voice & dara networking, LAN/desktop implementation, client support for agency-wide network imprint. services, WAN/LAN systems mgmt., disaster recovery, security, contract mgmt. services & telecommunications.

Reg. BS/comp. sci., business or engr. or equiv. combination of the desired staff mgmt., project mgmt., network sys. mgmt., & communications mgmt. (include voice & data) to job \$11\$ ST0407s. OHRM, Rm \$40, King County Admin Blg., 500 4th Ave., Seattle, WA \$910 by \$71297. For full application process see: WWW.MetroKC.gov/OHRM.

ANEOE

ATTENTION:

IMPLEMENTATION CONSULTANTS • TECHNICAL CONSULTANTS
SENIOR PROJECT MANAGERS • STRATEGIC ACCOUNT MANAGERS

Consider the clients-including more than 3,000 of the world's best.

Consider the commitment-to provide "best-of-class" financial software.

Consider the challenge-to grow, learn and earn alongside the most talented software specialists in the industry.

Consider the company-Hyperion is rated as a leading "high-growth" company by Business Week, Forbes and Software Magazine.

> Now consider this...we offer competitive compensation, full benefits-including medical/dental and 401(k)-plus exceptional bonus and career growth. Please send/fax/e-mail résumés with salary requirements to:

Hyperion Software Corporation 900 Long Ridge Road Stamford, CT 06902 Fax: (203) 322-3904 e-mail: lisbeth_burns@hysoft.com



Integrated Systems Professionals A Fast-Growing National Consultancy Offers Excitin Opportunities For Top Quality Professionals.

oreer Opportunities ad Long-Term Contract Opportunities

e in all SAP R/3 Modules Basis and ABAP

Looking To Hire? Looking To Be Hired?

SAP-only search firm matches those hiring w/those looking-all across the U.S. Discreet, no obligation search service. Low fee to hiring co.

The Sapient Group, Inc. Call: 908-223-9770

OREGON

0

> BEST Consulting 700 N.E. ilulmonds, Suile 1100 Portland, OR 97232 (503) 236-5776 (503) 236-5784 FAX Ω Е

1-800-224-1286

Start your day...



COMPUTERWORLD

The online connection of information technology leaders

www.computerworld.com

Bergen Brunswig Corporation

Bergen Brunswig Corporation, a \$10 billion leader in healthcare and pharmaceutical products distribution, has the following opportunities in our Information Resources Group located in Orange County, CA.

Lead Data Analyst

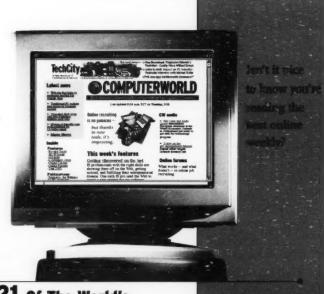
This candidate will lead JAD sessions to perform data analysis, while utilizing the ERWin tool to develop and maintain the logical data model. As the lead Data Analyst, will also provide mentorship and direction to Data Analyst staff members. May also be required to assist in the development of the Enterprise Data Model. This position requires 5-7 years experience as a Data Analyst, with 1 year in a lead capacity.

• Lead DB2 Database Administrator

This candidate will be responsible for providing 24 hour DB2 DBA support for existing production systems. This candidate will also be assigned to DBA duties in support of on going new development initiatives. As the lead DB2 DBA, provides direction and mentorship to DB2 DBA staff members, while assuming the most technical responsibilities such as system software upgrades and disaster recovery. This position requires 5-7 years experience as a DB2 Database Administrator, with 1 year in a lead capacity. #LH960110

We offer a ethical environment, competitive salaries and outstanding benefits, including 401 (k) and education reimbursement. For immediate consideration, send or fax your resume to: Bergen Brunswig Corporation, Human Resources Department P.O. Box 5915. Orange, CA 92863-5915. Attn: (Dept. Code). FAX:(714) 385-8877. E-mail: employmentbbc@compuserve.com

Equal Opportunity, Drug Screening Employer.



21 Of The World's Smartest Interactive Media Experts Agree On One Thing: @Computerworld Has The Best Editorial Content

An international panel of 21 authorities in the fields of journalism and interactive publishing selected @Computerworld from among 160 entrants representing 26 different countries for top honor in the weekly category for "Best Online Editorial Content". Editor and Publisher Interactive sponsors the awards, now in there second year. Other winners this year included The New York Times on the Web and C/NET.

If you haven't visited us lately, here's what you're missing:

Latest News updated three times daily

- CW Audio With Online Audio from Industry Newsmakers
- The @Computerworld Minute, a daily online audio news program
- Tech City- A New World Of IT Commerce and Service
- The @Computerworld Quick Poll - Your opportunity to be heard on industry issuesPlus online forums and weekly features from Computerworld and the
- Computerworld and the @Computerworld staff of online editors.

So, find out why Editor & Publisher singled out @Computerworld. Visit us today at www.computerworld.com.





COMPUTERWORLD

Best Places to Work Annual

Issue Date: June 1997 Close: May 13, 1997

1-800-343-6474 x8000



FORT WORTH, TX

3 years experience in the manage-ment of data center operations, systems

- administration or software development UNIX (Solaris, AIX) Windows NT and/or Novell
- Previous management experience in client/server computing and college degree in business or technical field

PRODUCT MANAGER - TULSA, OK

- Position requires 5+ years work history in an IT infra-structure and/or finance organization with at least 2-3 years managerial experience Candidate must have both a business and technical per
- spective emphasizing a strong financial background with experience in financial analysis and planning, cost accounting and product pricing

- accounting and product pricing
 MANAGER CONNECTIVITY RESOURCE
 MANAGEMENT-TULSA, OK
 Leading a group of individuals dedicated to providing the
 optimum connectivity capacity required to exceed service
 levels in both cost and reliability
 Position is responsible for both central Data Center and distributed cornectivity platforms incorporating the following
 technologies: VAVMNS, AlphaDNX, StrataNVCS, various
 routers, witches and the server technologies

ORACLE DBAs - DALLAS/FT. WORTH, TX

- ORACLE DBAs DALLASFT: WORTH, TX
 Requires frowledge of complex relational database concepts. Oracle's technical architecture and processes; oracle is technical architecture and processes; oracle citatibases
 1-4 years experience in the application development anction
 databases approfuncionaling arease;
 1-4 years experience in the application development anction
 database approfuncionaling arease;
 state of the processes of the processes of the processes are applications and the processes are applications are applications and the processes are applications and th

Yours and Ours.

OS/2 PROGRAMMERS - TULSA, OK
• Experienced OS/2 programmer proficient in C/C++
• Working knowledge of D8/2, EOCF/2, I.AN Server and OS/2
WARP Connect

IMS DB/DC DB2 DBAs - TULSA, OK

• 3+ years IMS DB/DC and DB2 Data Base Analyst

- experience required

 Oracle/VMS and TERADATA preferred
- VM SYSTEMS PROGRAMMERS TULSA, OK
- M STSTEMB TRAUGURANDIALERS LULLON, UM. 22-years of progressive experience as a VM Systems Programmer with proficiency in REXIC EXEC, EXEC2 and BAL Knowledge of VMESA control program and command language (CP) are required along with a working knowledge of the CMS operating system and command language).
- language
 Must have previous experience in the installation/mainte
- Must have previous experience in the installation/framile-nance of VM operating system and related components and installation/finantenance of VM program products
 Excellent interpersonal skills as well as being a self-starter and team player

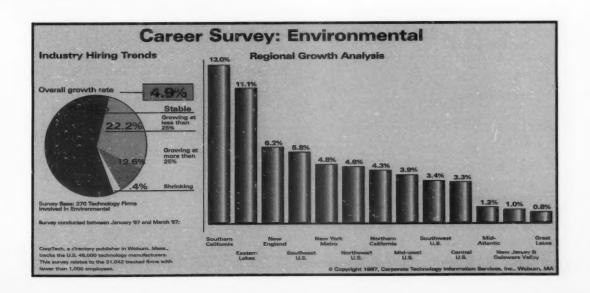
- and learn player

 SYSTEM ADMINISTRATORS (UNIX, NT AND VOS
 ADMINISTRATORS) DALLAS/PT. WORTH, TX
 AND TULSA, O.K.
 Requires 1-5 years systems administration experience
 Experience troubleshooting hardware, software and communication related problems in the related environments
 (UNIX, SUN/AIX, Windows/NT or Stratus/VOS).

 UNIX Systems Administration must be proficient with UNIX
 installation and upgrades, shell scripts and TCP/IP
 retworking, Also network performance turing and a good
 under-standing of C programming language preferred
 NT and VOS Systems Administrators must have knowledge
 of TCP/IP, X-S and SNA protocols. C or C++ programming
 inguage as plus. Both positions require interpressional
 skills along with the ability to work various shifts

SABRE Computer Services offers a rewarding environment with competitive salaries, travel privileges and a flexible benefits plan. For immediate consideration, piesses mail or fax your resume to: SABRE Computer Services, Attra: CWMA1197, P.O., Sox 619615, MD 2567, DFW Airport, TX 75261-6415, FAX: (817) 931-5269 or (917) 931-3496, Principles Chiy. No phone calls please. Equal Opportunity Employer, MFFDV.





COMPUTERWORLD, INC.

CEO/ President Gary I. Beach Senior Vice President/

to the CEO/President Karen E. Elliott

ADVEDTISEDS INDEX

COMPUTERWORLD

Executive Vice President/Publisher
Michael R. Rogers
Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171 Phone: 508-879-0700, FAX: 508-875-4394

Vice-President Consumer Marketing Gail Odeneal

PUBLISHER'S OFFICE: Assistant to the Publisher/Laureen Austermann MARKETING: Director, Marketing Com PUBLISHER'S OFFICE: Assistant to the Publisher/Laureen Austermann MARKETING: Director, Marketing Communications, Many Doyle, Serior Manager, Marketing Communications, Many Doyle, Serior Manager, Marketing Communications, Many Doyle, Serior Manager, Trade Show & Communications Project Manager, Trade Show & Communications Project Manager/Susan Thaxter, Marketing Communications Project Manager/Susan Manager, Manureen Burker PRODUCTION: Production Directory, Christopher P. Cuoco, Production Manager, Beverty, Wolff SALES PROFESSIONAL DEVELOPMENT: Operations Directory/Christopher Directory STRIBBUTION: Distribution Manager/Bob Wescott, Traffic Manager/Pat Walker INFORMATION SYSTEMS: Vice-President of IS/Walter Corosby IS/Walter Crosby

SALES OFFICES

NORTHEAST

Regional Vice President: Sherry Driscoll, District Managers Isabelle Kane, Laurie Marinone, Sales Office Coordinator: Tammy Boisvet, Sales Associates: Karen Beasley, Dianne McNell, ChenJ Stratton, 470 Totten Pond Rd., 5th Floor, Waithsam, Md. oztys, (50.8) 97-970 FAX: (617) 890-2669 Hearing Impaired: (800) 428-8244

NEW YORK & NEW JERSEY

List Bruin 9-11, 19-19-13 Regional Vice President James Hussey, Senior District Managers: Fred LoSapio, Victoria Gonin, Barry Cheney, Senior Account Executive - John Bosso, Sales & Office Associate: Susan Kusnic, Sales Associates: Jean Dellarobbo, Valene Lucacel, John Radrinal, Madc Center, 1-56 West Passac St., Robin 19-19, 19-19

SOUTH-ATLANTIC
Regional Vice President: Bernie Hockswender Sale SOUTH-ATLANTIC Regional Vice President: Bernie Hockswender, Sales Administrator: Jennifer Pattenaude, 1565 Woodington Circle, Suite 20.1, Lawrencewile, CA 20044 (270) 39-1804 FAX: (270) 391-3056 Hearing Impaired: (800) 449-4974, Senior District Manager Mike Bachman, Sales Associate Many Cavaliere, 175 Strafford Ave. 81, Wayne, PA 19087, (610) 575,458 FAX: (610) 575-4585 Phillip Brathwale, Account Exercitive, 2457.8. FMX: (407) 521-8716 Ste. 321, Orlando, FL 32855 (407) 521-918 FAX: (407) 521-8716

Senior District Manager: Sharon R. O'Brien, Account Executive: Laurie Gomes, Sales Associate: Jasmine Huffman, 875 N. Michigan Avenue, Suite 2846, Chicago, IL 60611 (312) 943-4266 FAX: (312) 943-2214

SOUTHWEST

Senior District Manager: Jennifer Hedges, Sales Associate: Brenda Shipman, 14651 Dallas Parkway, Suite 304, Dallas, TX 75240 (972) 233-0682 FAX: (972) 701-9008 Hearing Impaired: (800) 822-4918

Francisco Vice President Custom Publications/Elaine R. Offenbach, Sales Associate/Nikki Wilson, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555 FAX: (415) 347-3312

Director: James Hussey, 500 Old Connecticut Path, Box 9171, Framingham, MA 01701-9171 (508) 879-0700 FAX: (508) 872-Production Coordinator: Peggy Hennessy, 500 Old Connecticut Path, Box 9171, Framingham, MA 01701-9171 (508) 879-0700 FAX: (508) 879-0446

COMPUTERWORLD INFORMATION MANAGEMENT DIVISION

Computerworld VAR Database: Carol Mullen/ National Sale Manager, Account Executive/Sean Weglage, (508) 879-0700 FAX: (508) 879-0184

Computerworld Buyers Database East: Regional Manager, Database Services/Linda Clinton, (508) 879-0700 FAX: (508) 879-0184

Vice President/General Manager, Richard Mikita, Vic President: John Carpenter.

CUSTOM PUBLICATIONS

COMPUTERWORLD JOURNALS

MARKETPLACE ADVERTISING

Vice President Recuritment Adversing flohn Corrigan, Marketing Director/Derek E. Hullitsky, 500 Old Connection Path, Framingham, MA 07019-371 (800) 343-6474, New England & Upstate New York: Regional Manager/Nan Percival, 470 Ottor Prof. Mg/Harm J. MA 0315-6474, Account Executive/Nancy Mack. (800) 343-6474, Account Executive/Nancy Mack. (800) 343-6474.

ALLIANCE MARKETING

izabeth Cooper, Sales Associate/Nancy Dillon, 500 ilevard, Suite 400, Burlingame, CA 94010 (415) 347 0555 FAX: (415) 347-8312

ADVERTISING OPERATIONS Display Advertising Production Manager: Paula Wright, Display Advertising Coordinators: Lisa Tanner, Gregg Pinsley, (508)-879-0700 FAX: (508) 879-0446 RECRUITMENT ADVERTISING SALES OFFICES

NORTHERN CALIFORNIA

SOUTHERN CALIFORNIA

District Manager: Nancy Coy-Bianchi, Account Executive: S Davis, Sales Associate: Pat Duhl, 2171 Campus Drive, Suitt 100, Irvine, CA 92612 (714) 250-3942 FAX: (714) 476-8724

(No. President Western Advertising Sales: Richard Espinoza, Senior District Managers: Ernie Chamberlain, Christine Curry, Luda Holfono-Ousag, District Managers: Dernye Rehoe, Lisa Kowalsia, Holly Nissalke, HR Bepresentainve: Letica Lefane, Kowalsia, Holly Nissalke, HR Bepresentainve: Letica Lefane, Kowalsia, Holly Nissalke, HR Bepresentainve: Letica Lefane, Salanon Dempeye, Claude Cazbaron, Geras Hasa, Andrea Zurek, Sales Associates: Larisa Gagainis, Alica Giovannini, Emmie Hung, Heather Hackman, Nina Pulkonen, Bonnie Robson, Office Services: Jessica Abude, Sales Coordinator: Yonne Zurings, 300 Aliport Bouledard, Suite 400, Burlingame, CA 94010 (415) 347-555 FAK: (415) 347-8312 Hearing Impaired. (800) 900-3179.

Wid-Atlantic: Regional Manager/Jay Savell, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (800) 343-6474, Sr. Account Executive/Caryn Dlott, (800) 343-6474 TDD: (800) 208-0288

208-0288 South-Atlantic: Regional Manager/Kalie Kress-Taplett, 8304
Professional Hill Drive, Fairfax, VA 22031 (703) 573-4115, Sales
Manager/Pauline Smith (800) 343-6474
Mildwatts Regional Manager/Pat Powers, 1011 East Toutly
Avenue, Suite 550, Des Plaines, II. 60018 (847) 837-4433.
Account Executive/Nick Burke (800) 343-6474 TDD: (800) 227-

9437
Southwest: Regional Manager/fillen Cross, 14651 Dallas Parlows; Ste. 204, Dallas, TX 75240 (978) 726-7485, Account Executive/lim Paters (1900) 343-6474
Northwest: Regional Manager/Christopher Glenn, 246 Casitas Ace., San Francisco, CA 9417 (415) 665-2444, Account Executive/fishold Franz, (200) 349-6474
West: Regional Manager/Ellen Cross, 217 Campus Drive, Ste. 100, Invine, CA, 3217; (714) 350-0164, Account Executive/fishold Franz, (200) 349-6474
Total (200) 343-6474 TOD: (200) 203-3667
Internet Careers Size; Jennifer Aruse, Sales Associate, 500 Old Connecticut Path, Framingham, MA 01701-9171 (800) 343-6474

Computerworld Buyers Database West: Regional Manager, Todd Herrold, (415) 347-0555 FAX (415) 347-8312

DIRECT RESPONSE CARDS 5:00 Old Connecticut Path, Framingham, MA 01701-9171 (800) 343-6474

National Accounts Director/Norma Tamburrino, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-

INTERNATIONAL DATA GROUP IcGovern; President, Kelly Conlin; Chief Operating Officer, Jim Casella

Computerworld is a publication of international Data Group, the world's largest publisher of computer-related information and the seading global provided or information services on information technology, International Data Group publishes over 275 compute sublications in over 75 countries. Sixty million people read one or more international Data Group publications such omorth.

ADP	Nokia Display Products
Centura Software Corp. *98 http://www.centurasoft.com 53, 55	Novell
http://www.clarify.com	Opin Systems
Compaq Computer Corp 22-23, 34-35 http://www.compaq.com	Oracle Corp
Computer Associates 5 http://www.cai.com	Peritus
Compuware	Platinum Technology
Data General75 http://www.dg.com	Procom42 http://www.procom.com
Data Dimension	Red Brick
Digital Equipment Corp	SAS Institute
MC Corp	Select Software*97 http://www.selectsoftware.com
xpersoft	Softbank58
http://www.expersoft.com Gateway200	Source Services
http://www.gateway2000.com	State Of The Art
http://www.hp.com	Sun Microsystems 21, 67, 69, 124 http://www.sun.com
http://www.ibm.com	Sybase
mation	Tandem
nformix Software	http://www.tandern.com Tech Corps33
ntel30-31 http://www.intel.com	Toshiba
ntersystems Corp	UUNET
D Edwards40 http://www.jdedwards.com	Visio
Cingston Technolgy	Visioneer128 http://www.visioneer.com
awson Software	Visiontek
(800) 477-1357 .eadership Series32/33	Workstation Group44 http://www.wrkgrp.com
ucent Technologies	Xerox
AaxStrat	Advertisements that appear in the vertical
AcAfee54 http://www.mcafee.com	Healthcare Journal Lawson Software
ACI9	http://www.lawson.com (800) 477-1357
http://www.mci.com	Siemens Rolm
http://www.micron.com //icrosoft	http://www.siemensrolm.com Sunquest
Aicrosoft	3COM

* Internet/Intranet Select Edition

To have your Internet address listed here, please contact Paula Wright at (508) 620-7716 This index is provided as an additional service. The publisher does not assume any liability for e

HAVE A PROBLEM WITH YOUR COMPUTERWORLD SUBSCRIPTION?

Zp

State

Name

We want to solve it to your complete satisfaction, and we want to do it fast.

Please write to:
COMPITEMPORTB, P.O. Box 2043, Marion, Ohio 43305-2043.
Your magazine subscription label is a valuable source of information for you and us. You can help us by attaching your magazine label here, or copy your name, address, and coded line as it appears on your label. Send this along with your correspondence.

Address Changes or Other Changes to Your Subscription
All address changes, title changes, etc. should be accompanied by your

address label, if possible, or by a copy of the information which appears on the label, including the coded line.

Your New Address Goes Here	Address shown: U Home U Business
Name	
Company	
Address	
City State	Zip

It is better to write us concerning your problem and include the magazine label.

Also, address changes are handled more efficiently by mail. However, should you need to reach us quickly the following toll-free number is available: 1-800-552-4431 Outside U.S. call (614) 382-3322). Internet address: circulation@cw.co

COMPUTERWORLD allows advertisers and other companies to use its mailing list for selected offers we feel would be of interest to you. We screen these offers carefully, if you do not want to remain on the promotion list please write to the following address. — COMPUTERWORLD, Circulation Department, 500 Old Connecticut Path, Framingham, MA 01701.



Gateway Delivers

Combine good, hard-working people and a bullish commitment to Value of Ownership. You get Gateway 2000. The Fortune 500 PC manufacturer planted on the South Dakota prairie. We deliver quality, high-performance PCs and award-winning customer service to computer users all over the planet.

Want to know more? Call us today. Your dedicated account representatives will tell you all about our desktop, portable and big screen PC/TVs. And about our company. It's a success story.





8 8 8 - 8 8 8 - 0 3 8 2

www.gw2k.com

© 1997 Gateway 2000, Inc. GATEWAY 2000, black-and-white spot design, "G" logo, and "You've got a friend in the business" slogan are registered trademarks of Gateway 2000, Inc.

For information on advertising, call 203-857-5100

Marketplace

NEW & NOTABLE

DataViz announces Desktop To Go[™] for Pilot[™] from U.S. Robotics Synchronized data between Microsoft® Outlook[™] and Pilot[™]

DataViz announced today Desktop To Go for Pilot which includes synchronizers for Milotook and Lotus Organizer 97. Any additions, modifications and/or deletions made on either the desktop or Pilot are automatically updated on both

Desktop To Go provides a variety of synchronization options for users. The standard synchronization option reconciles any changes made to either machine. Afternatively, users can synchronize always using data from either the desktop or Pilot. Re-synchronization is a third option to use when various problems have occurred with data on either machine. This mod will synchronize and resolve conflicts such as duplicate records, mass record loss, etc.

Desktop To Go provides field level synchronization for contacts, appointments, tasks and memos. By using field level synchronization, a conflict will occur only when data has changed in the same field of a particular record on both machines. If a conflict does occur, Desktop To Go provides the following resolution options; the conflicting records are added as duplicate records to both machines, desktop data can override Pilot data or Pilot data can override desktop data.

Desktop To Go provides user customizable field mapping. Default field maps are included for each type of data and can be easily modified by the user for mapping such things as custom fields. The Desktop To Go

field mapping dialog also has the ability to map combined fields to individual fields. Visit the DataViz web site at www.dataviz.com. For more information or to receive a promotional Desktop To Go call 203-268-0030 or 800-733-0030. U.S. Robotics is one of the world's leading suppliers of products and systems that provide access to information. For further product information, customers can contact Robotics at 800-881-7256 or visit the Pilot web site at www.usr.com/palm.

AKVA SOFT, INC. announces that in its advertisement in Computerword the section Programming Languages should contain the following languages: C, C++, Assembler, Pascal, Clipper 5.X, PL/I, SmallTalk, Adabas/Natural, VHDL, Cobol. The section containing MS DOS, all versions of Windows, OS2, Unix is titled Operating Systems.

Alva Soft personnel is made up of highly qualified software engineers who are equipped with the most modern development technologies and techniques. Akva Soft is capable of: problem analysis and advanced software architecture development; optimization and mathematical modeling; artificial intelligence infusion; advanced software systems development, integration and re-engineering; and advanced programming services. In order to be able to handle the Year 2000 problem Akva Soft developed tools for "Global-Search-and-Replace" Date-related variable fields. Using these tools in combination with manual methods Akva Soft guarantees 100% accuracy for compliance with Year 2000.

AKVA SOFT, INC. 314 Commerce St., Alexandria, VA 22314, Phone: (703) 299-0804, Fax: (703) 684-6971

Version 7 of EDT+ integrates OpenVMS and Windows environments

Boston Business Computing, the leader in OpenVMS coexistence tools, announces the latest release of its award winning flagship product, EDT+ for Windows. This defacto editor for millions of OpenVMS users is now available on UNIX, MS-DOS, WindowsNT, WindowsNT, WindowsNS, Wind

For more information contact David Pikcilingis, 508-725-3222 x305, fax 508-725-3229 or dcpik@bbc.com

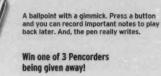
TECHNO

WIN EVERY WEEK!

Computerworld Marketplace TechnoToys Sweepstakes

April 21 TechnoToy:

Pencorder by Machina, Inc.



By entering into the weekly TechnoToys giveaway, your name will automatically be entered into the year-end Super Prize Sweepstakes where you could win as much as \$25,000 in cash!

COMPUTERWORLD
The Newsweekly for Information Technology Leaders

Fax this completed form, or all of the following information to: (800) 898-2299.

Yes, I want to enter to win a Pencorder. Please also enter me in the end-of-year 1997 Super Prize Sweepstakes Drawing.

Name:
Title:
Company:

Address:

City: _____State: ___Zip: ____

Fax:

Are you currently a Computerworld subscriber?

VeS NO Issue Date: 4/21/97

No purchase necessary. All entries must be received no later than 11:59 am (EST) Mon, April 28, 1997. Winner will be determined in a random drawing on or about 5:00 pm (EST) Mon., April 28. See official rules within the Marketplace section.

Marketplace

For information on advertising, call 203-857-5100

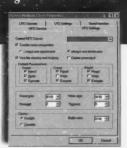
Distinct NFS 95

Easiest way to Share Files, Programs and Printers



Highlights:

- Integrates seamlessly into Windows 95
- Mounts NFS drives from Explorer or Network Neighborhood
- . Supports file and record locking
- Allows central authentication with a single server running PCNFSD for all NFS connectivity
- · Prints to NFS or LPD print servers
- Allows login to all systems with a single login name and password or different login names for each system
- Allows single-operation logout of all systems accessed through Network Neighborhood
- Fine tunes performance parameters for each server you access







http://www.distinct.com sales@distinct.com Phone: 1-408-366-8933 Fax: 1-408-366-0153

Distinct IntelliTerm

Integrated Terminal Emulator for DEC and IBM® Systems





Highlights:

- TN3276 Emulation-Models 2,3,4 and 5 (for IBM Mainframes)
- 31796 Vector Graphics & 3279S36
- TN5250 (24x80, 27x132) (for AS/400)
- VT52, VT100, VT220, VT320 & VT420 emulation (for DEC and UNIX Systems)
- Customizable keyboard layouts, poppads and session profiles
- VBA™ Advanced Scripting Language
- DDE, HLLAPI, EHLLAPI, WinHLLAPI and Visual Basic™
- Available for Windows 3.11, Windows 95 and Windows NT

Free Evaluation Copy Available at...





408.366.8933

http://www.distinct.com Fax: 408.366.0153 E-mail: cworld@distinct.com Fastiacts: 408.366.2101

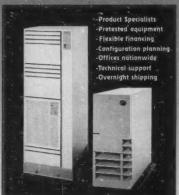
Looking For The BEST Company To Give You The BEST Value In IBM Computer Hardware?

We're IBM Experts:

- Mele Inti Pahe
- RS/6000 • ES/9000
- -AS/400
- Series/1
- · PCs
- Networks & Integration

Sales & Rentals

- √ Processors
- ✓ Peripherals
- √ Upgrades
- √ Reconditioned





http://www.dempseybas.com



Buy . Sell . Rent (800) 888-2000



Hook up with NetCom3.



Over 2,500 LAN users have chosen NetCom3 to organize their networks and maximize productivity. Call today for a



FREE sample disk and full color brochure. And ask about our 48-Hour Quick Ship Program! 1(800)4321-EDP ext. 368







For information on advertising, call 203-857-5100

Marketplace

Which has serviced over 175 diverse clients specializes in providing VM, MVS, VSE service to clients who need:

•OUTSOURCING

•REMOTE COMPUTING

YEAR 2000: Mainframe Conversion Test Environment *TAPE CONVERSIONS SYSTEMS INTEGRATION CONSULTING

•Financial Services •Non Profit •Software Developers ·Healthcare ·Manufacturing/Distributing ·Publishing

We are the "Boutique" of the Computer Services World

(201) 319-8787 • (800) 274-5556

Is Your Organization Ready for the Year 2000?

- ◆ Full Conversion Strategy
- Assessment/Planning
- ◆ Supervision/Conversion/Testing
- Flat fee, low rates
- ◆ Off Site Development
- Automated Tools, Human Resources ◆ Specialized COBOL Technicians
- ◆ Previous Experience Year 2000 Conversions

You take care of your business, we'll take care of the conversion! Don't wait until 1999. Call us now for a FREE plan.

ISC Corp. Rye, New York (800) 298-1336

REACHING OVER 909,300 POTENIAL BUYERS

Call today to get your message in front of the powerful Computerworld audience. (203) 857-5125

COMPUTERWORLD

Year 2000 Problem

We can help to find a solution

PLATFORMS: IBM Mainframes, IBM Compatible PCs. PROGRAMMING LANGUAGES: ADABAS/NATURAL, COBOL, PL/1, Assembler. TOOLS: Automatic and semi-automatic.

CAN DO: Impact analysis, source code conversion, testing.

100% accuracy for compliance with year 2000 guaranteed. **WE'LL BEAT ANY DEAL**

AKVA SOFT, INC.

314 Commerce St. Alexandria, Virginia 22314

Phone

Tel: (703) 299-0804/05 E-mail: akvasoft@erols.com

Facsimile: (703) 684-6971

Custom Application Development

INDUSTRY EXPERIENCE: Commercial, Federal Agencies, Manufacturing, Retail, Financial,

CAPABILITIES: Outsourcing, Remote Computing, Year 2000 Conversion, Systems Integration & Consulting, Web & Internet Development, Client/Server Design & Development, Fast Turn-SKILLS:

- Platforms: IBM Mainframes. IBM Compatible PCs. Unix Workstations. Sun/Solaris Workstations
- Operating Systems: MS-DOS & All Versions of Windows, Unix, OS/2
- Programming Languages: C/C++, Java, Visual Basic
 Architecture: Client/Server, Open Systems, Online Transaction
- Processing, Batch Processing, Object-Oriented Methodologies
- Networks: LAN, WAN, TCP/IP, X.25, Novell Netware
- Data Management: Oracle, Access, Sybase, SQL Server, Gupta

Intelligent Systems 301-840-9563 http://www.Intelligentsys.com

I want to reach over 909,000 potential buyers! Please send me a Computerworld Marketplace media kit.

Name

Company Email

Address

Fax

Fax this form to (203) 838-1425, or call (203) 857-5125 and we'll mail you your information right away!

INVELAGE MALES - NO PRINCIPASE, VANMENT ON CONTINUATION NEEDSAMY - To enter the Swee below, followed compression published in this effor. Your entry must be received by the dat where in this offer or by 1/15/90, whichever is some:

reas not yet 17 2000, venicureren is anomen.

Appendission. Felinare sull be addected in irrandom disovinge from all eligible entires received. Einly first
addected in a superator fenivoling from anomy all eligible entires. Sovengetistas buyins 97,296. Disovingor
de on or about 47,207.89 by Ventura Association. Inc., an independent judging enganization volume furlibrarium will be hald at 1940 Avenum of the American. How York, NY 10018. You must not be present

to vain.

CONSUMER DISCLOSURE collector confirm presentations of the averapointees may present different price chainers. Value at a given period best and be appreciated by the runs. All pice values well have the option of reductions upon pain collectors and well not reductive to provide the collectors. Clausel Price - SCADIO, 15 contained monitores received when and while of various quark price are not force. I General Price - SCADIO, 15 contained with collectors of SCADIO, 15 contained the SCADIO, 15 contained Price - SCADIO, 15 contained and Price - SCADIO, 15 contained and the SCADIO, 15 contained and the SCADIO, 15 contained and the SCADIO, 15 contained and price of the SCADIO, 15 contained and processing and the scale of price Price - SCADIO, 15 contained and the SCADIO, 15 contained and price of the SCADIO, 15 contained and 15

Contribution on in companions with one content 2000 without, a Super From 2 companions grows will be executed.

Annumble, Saud/Weige content the priced up of local below. All direct executionary grows on the frequent to write.

Beart-Value and/or annumble title, resp., Scenar and registration less are various's respectivelity as an oway.

12 mention of a state proceeding a specified of the fall. For pieces: against a resultability and and respectively a second to the resultable produced and respective of the resultable produced and resultable and resultable produced produc

inners list (available after 6/30/90) send sell-addressed, stamped envelope by 1/15/88 to: Super Price ers, P. O. Box 9193, Modford, NY 11763-9193.

Wassen, Y., U. Der 1913, Monther, N. Y. 17/35-9183.

THE FELLOWING PAPES TO THE SWEETSTAND ADDRY: His purchase, paymont or contribution successary to row. Its photocopied on mechanically reproduced entire will be accepted. Het requestable for technical and mechanical mechanical properties of an international contribution of contributions for fail for the contribution of fails, militarities, and the contribution of the contribut

and mass with the entermed.

Winners and discussion will be by mail. A winner may be required to sign and return as Affidavit at Eligibility distallably Philadivity Indiana within 14 days of them pained on self-colorium on level to will be disquaried, and principles medication intermed as medicinestical and main in disquariedation. It was pay poin in sent by a case, it will be removed to passent or long augments and the Affidavit of Eligibility and foliations much be igned by the passent or will be removed to passent or long augments and particular partic

All price values are in U. S. currency. No transfer of price permitted. A winner is responsible for all turns on his/

Camadian residents, in order to wis, must first currently answer a time-limited shill testing up mail. Any bispation regarding the conduct and ownerling of a prize in this publicity control province of Gueboc may be submitted to the Regio don alcools, due courses of dos juez.

alex may be presented in different creative presentations by different organism of the Americas, New York, NY 10018, the independent judging on. Ventura Associates, lic., recovers the right to withdraw the presention

Employees of Soverpt-takes Administrator, presenting organizations, their advertising agencies and premotional com-panies involved in this premotion and their familiers, agench, accessers and estimpton are indigate to participate in the premotion and that on indigate for any prime convent familier. The parties haven accuroloogy that SCA is not liable for any price severals payable to premotion participants in violation of this term.

liable for may price severally purpoles to presention participants in violation of this turn.

COMPUTEWWIND HEXAMITORY WHIREY SWIPEPS/IMEE SPEAR RELES. No preclass successory. Compliant efficies where you may relied along indemnation and papea including lists word parts and fix to: (000888-2299. Incomplete notion not cliquide. Swiperparkine largest 1221 am (033) Montage (tide data of the insue). All unities annual to be in the large of the insue) which is made control to the large of the insue) which may not control to the large of the large of

Accompations or your to logal US residents. 18 & older. Dels of winning determined by total number of entire received. Ent. distributors: 150,484. Symmers: Computerwood. Inc. 500 Did Commercial Pads. Fermingham, Med (170): Employees of Computerwood. Inc., in affiliates, substitutions, tenders, or develocing its procession agancies of immediate families of such on displict. All follows, dams it hand have it might interest any Valid in Proton Rice is winner published.

For winners first (available within 4 weeks of the drawing), send a SASE to: Sweepstakes Wir TachnoTovs Sweepstakes, 500 Old Communicat Poth, Framinghem, MA 01701.

Start your day...



COMPUTERWORLD

The online connection of information technology leaders

www.computerworld.com

I have to reach my
Year 2000 deadline.

But how?

Ardes 2k is the only proven millennium solution.

The deadlines for Year 2000 compliance cannot be missed. This innovative product gives your technology specialists the knowledge and resources they need to understand, and fix, your millennium problems.

Ardes 2k was developed as the successful result of Data Dimensions' 5 years practical experience with creating solutions for the millennium problem. It integrates proven strategies, processes, and tools based on experience evaluating and updating over 3 billion lines of code for hundreds of organizations, including over 30 Fortune 500 companies. It allows your organization to develop trained millennium experts quickly and easily, with quality support from a worldwide leader.

Customizable, Scaleable, Tools-Neutral Technology

Ardes 2k incorporates a tools-neutral process bound only by the best automation software available. The key is a unique Modular Repeatable Process (MRP) that can be customized for individual environments, dynamically scaled to any size organization, and configured to measure any quantifiable results. As a result, your cost and training time is effectively minimized, while your enterprise's productivity and efficiency is significantly increased.

Innovative Automated Technology Transfer

Data Dimensions' unique technological process lets you easily transfer Ardes 2k knowledge to your information systems personnel and effectively implement solutions. By utilizing CD-ROM and Internet technology, Ardes 2k Year 2000 solutions are now available to a worldwide client base.

Comprehensive Enterprise-wide Solutions

Ardes 2k is the most comprehensive millennium update package available. The easy-to-use format provides technical information that can be optimized for your enterprise environment via CD-ROM, Internet Web site access, complementary support tools, products and services.

Get Started Now

Ardes 2k is the only proven solution that can help your organization meet the complex challenge of 21st century compliance.

For more information, or to order Ardes 2k, call Data Dimensions at 800-499-1979, or visit our Web site at http://www.data-dimensions.com



Årdes 2k™



2000 Skyline Tower • 10900 N.E. 4th Street Bellevue, Washington 98004

The Week in Stocks

Gainers

INDUSTRY ALMANA	C
-----------------	---

Investing in Year 2000

s the countdown to the year 2000 slips below 1,000 days, interest in companies that focus on fixing those pesky two-digit date fields is heating up.

Taking note of this opportunity is the American Stock Exchange, which has decided to pull together a collection of the control of the collection of th

of companies under a new banner: the de Jager Year 2000

The exchange worked with year 2000 consultant Peter de Jager to compile a list of players that could potentially benefit from year 2000 problems, including consultants, integrators and software providers, says a spokesman for the American Stock Exchange. The list was finally winnowed down to 17 companies that, as a group, "would act as a good barometer and in-dicate a trend in the health of this sector," he says.

Keep in mind that an Index isn't a mutual fund - investors can't trade in it directly — they trade options against it. If they believe the sector is due for fucrative times, they can buy contracts for upward movement. Conversely, if they believe the companies or the year 2000 problem is overhyped, they can purchase options for a downward slide.

Several analysts say some of the new Index's companies are puzzling at best.

"This reminds me of the early Internet indexes that included Cisco and Cas-

cade," says David Takata,

daq: PSFT) and Electronic Data Systems Corp. (NYSE:

EDS) as unusual choices for a year 2000 group.

"It's somewhat of a prediction on my part," says de

Jager, president of De Jager

Ontario. "Some on the list

aren't necessarily doing a lot now but will play a bigger and bigger role." New application sets

from application vendors such as PeopleSoft, for in-

hope of some of the small

companies who the big ven-

- Stewart Deck

stance, will be "the only

dors will overlook."

and Co. in Brampton

an analyst at Grunthal & Co. in Beverly Hills, Calif. He cites PeopleSoft, Inc. (Nas-

MILLENNIUM INDEX

A sampling of companies in the de Jager Year 2000 Index

- Analysts International
- **Computer Associates**
- **Computer Sciences**
- Compuware
- Data Dimensions
- Information **Management Resources**
- Intersolv
- PeopleSoft
- Platinum Technology
- Sterling Software
- Viasoft

ciun	35-MEEK	RANGE		2 PM	CHANGE	
-		-	distantant forms	- 3	1724	25
COMS	81.38	29.63	3 COM Corp. (L)	29.88	-2.25	-7.0
AIT	65.00	49.63	AMERITECH CORP.	57.88	0.38	9.7
ASND	80.25	38.38	ASCEND COMMUNICATIONS (L)	40.88	-1.75	-4.1
T	43.88	31.63	ATAT	33.75	0.00	0.0
BNYN	10.75	1.63	BANYAN SYSTEMS INC.	2.13	-0.19	-8.1
BAY	36.88	15.38	BAY NETWORKS INC.	17.75	0.75	4.4
BEL	71.38	43.50	BELL ATLANTIC CORP.	59.75	0.88	7.5
BLS	47.63	35.25	BELLSOUTH CORP.	40.88	0.50	1.2
BRKT	42.25	10.00	BROOKTROUTTECHNOLOGY	10.63	-4.31	-28.9
CS	43.63	26.50	CABLETRON SYSTEMS	31.88	2.75	9.6
CSCC	91.25	23.50	CASCADE COMMUNICATIONS	27.63	-0.38	-1.3
CGRM	24.00	9.38	CENTIGRAM COMMUNICATIONS	10.25	-0.50	-4.7
CSCO	75.75	44.25	CISCO SYSTEMS INC.	48.63	-2.31	-4.5
CLIX	8.25	1.69	COMPRESSION LABS INC.	2.31	0.00	0.0
CMNT	10.50	4.75	Сомрится Негиоли Теси.	5.31	-0.06	-1.2
MODX	12.75	4.75	CrossCowm	8.00	0.38	4.9
DIGI	35.88	12.63	DSC COMMUNICATIONS	21.25	1.13	5.6
FORE	44.75	10.00	FORE Systems Inc.	13,43	-1.88	-12.1
GDC	18.88	6.13	GENERAL DATACOMM INDS.	7.00	0.38	5.7
GSX	46.75	36.13	GENERAL SIGNAL NETWORKS	37.50	0.38	1.0
GTE	49.38	37.75	GTE CORP.	44.13	1.00	2.3
LU	60.63	30.63	LUCENT TECH.	54.50	3.00	5.8
MADGE	34.00	6.88	MADGE NETWORKS NV	7.00	-0.25	-3.4
MCIC	38.75	22.38	MCI COMMMUNICATIONS CORP.	37.88	0.94	2.5
MNPI	28.00	5.50	Microcow Inc.	15.94	0.06	0.4
NETM	18.88	2.63	NETMANAGE INC.	3.00	0.13	4.3
NTRX	10.88	2.38	NETRIE CORP. (L)	2.50	-0.19	-7.0
NCDI	16.25	2.88	NETWORK COMPUTING DEVICES	10.38	0.36	3.8
NWK	30.88	11.13	NETWORK EQUIPMENT TECH.	13.38	2.00	17.6
NETC	30:25	15.25	NETWORK GENERAL	17.50	-1.83	-9.7
NN	37.25	20.25	NEWBRIDGE NETWORKS CORP.	29.88	1.38	4.8
NT	77.00	45.00	NORTHERN TELECOM LTD.	66.50	2.50	3.9
NOVL	15.63	8.38	Novellinc.	9.38	-0.13	-1.3
NYN	53.38	42.00	NYNEX CORP.	44.25	0.13	0.3
OCTL	31.75	13.50	OCTEL COMMUNICATIONS CORP.	16.63	-0.38	-22
ODSI	27.50	9.75	OPTICAL DATA SYSTEMS INC. (L)	11.75	-0.38	-3.1
PCTL.	41.25	9.73	PICTURETEL CORP.	9.63	-0.38	-3.8
PTON	6.50	1.31	PROTEON INC.	1.63	-0.44	-21.2
RACO	7.00	2.63	RACOTER INC. (L)	2.63	-0.38	-12.5
RETX	10.88	3.38	Revis	4.13	0.44	13.9
SBC	58.25	46.00	SBC COMMUNICATIONS	51.00	0.13	0.2
SFA	20.38	12.00	SCIENTIFIC ATLANTA INC.	15.00	9.38	2.6
SHVA	87.25	8.25	SHIVA CORP.	8.63	1.69	-16.4
FON	48.00	34.50	SPRINT CORP.	44.50	-0.13	-0.3
SMSC	18.75	8.25	STANDARD MICROSYSTEMS CORP.		0.00	0.0
USW	37.25	27.25	U S West Inc.	32.13	-0.25	-0.8
USRX	105.50	45.83	US Rosonics	51.00	-3.30	-6.4
XIRC	31.13	10.00	XIIICOW (L)	10.13	-5.38	-34.7
			XYLAN CORP. (L)		-0.13	-0.8

NIPNY	65.00	49.88	NEC AMERICA	59.75	0.08	0.0
SGI	30.13	13.75	SILICON GRAPHICS (L)	13.75	-4.13	-23.1
SUNW	35.73	22.00	SUN MICROSYSTEMS INC.	27.13	-0.88	-3.7
L	2.10	-			UP S	EC-
AMH	14.00	8.13	AMDAHL CORP.	3.88	0.96	0.7
DGN	20.75	9.00	DATA GENERAL CORP.	18.00	2.60	12.5
DEC	63.25	25.00	DIGITAL EQUIPMENT CORP. (L)	27.00	1.88	7.3
1894	170.13	89.13	1992	139.38	6.98	4.5
MDCD	20.25	3.88	MERIDIAN DATA NIC.	4.13	0.13	3.7
NETF	6.13	1.25	NerFnance	1.75	-0.18	-17.6
SONT	20.13	10.50	SEQUENT COMPUTER SYS.	16.50	1.38	9.7
SEQS	4.38	1.88	SEQUOIA SYSTEMS INC.	2.38	0.06	2.7
SRA	35.13	16.63	STRATUS COMPUTER INC.	31.00	0.38	3.2
TDM	15.23	8.50	TANDEM COMPUTERS INC.	13.00	1.13	9.5
4.000		0.00	the discount of the same of th	4.00	0.75	-

207	_				-	2000
ADBE	45.13	28.50	Appea Systems Inc.	40.88	-0.13	-0.3
AMSWA		3.75	AMERICAN SOFTWARE INC.	6.13	-0.50	-7.5
APLX	42.50	3.63	APPLIXING.	4.81	0.75	18.5
ARSW	82.73	21.00	ARBOR SOFTWARE	23.00	-3.75	14.0
ADSK	44.23	18.50	Autopesiting.	32.13	2.19	7.3
BGSS	32.50	14.88	BGS Systems Inc.	30.75	0.75	2.5
BMCS	51.80	25.38	BMC SOFTWARE INC.	45.00	-0.23	-0.6
BOOL	27.50	14.00	BOOLEAND BASSAGE	22.75	0.50	2.2
BORL	20.23	4.75	BORLAND INT'L INC.	6.94	0.31	4.7
BOBIY	55.50	7.75	BUSINESS ONIECTS (L)	8.31	-0.91	-8.9
CAYN	10.00	3.44	CAYENNE SOFTWARE INC. (L)	3.75	-0.19	-4.8
CNTR	6.73	2.63	CENTURA SOFTWARE	2.88	-0.13	-4.2
COGNE	39.50	18.25	Cognostuc.	24.63	-2.25	-8.4
CA	67.83	37.25	COMPUTER ASSOCIATES	43.50	2.13	5.1
CVN	13.25	3.13	COMPUTERVISION CORP.	3.50	-0.13	-3.4
CPWR	35.50	12.25	COMPUWARE CORP.	34.88	2.38	7.3
CSRE	32.00	10.75	COMSHARE INC.	13.88	-0.63	-4.3
COSFF	13.88	6.00	COREL CORP.	6.00	-0.38	-5.9
DWTI	8.90	2.63	DATAWARE TECHNOLOGIES INC.	3.13	-0.25	-2.4
FILE	58.50	9.50	FILENET CORP.	12.38	0.75	6.5
FRITE	81.75	16.75	FORTE SOFTWARE	16.73	-4.00	-19.3
FTPS	14.38	4.44	FTP SOFTWARE INC. (L)	5.00	0.23	5.3
HUMCE	47.63	23.00	Нимминсвию Сомм, 170.	25.00	0.00	0.0
HYSW	26.33	10.25	HYPERION SOFTWARE CORP.	17.13	-1.50	-8.1
IRIC	16.33	11.00	INFORMATION RESOURCES	12.50	-0.25	-2.0
IFMX	31.13	7.00	INFORMIX CORP. (L)	7.73	0.25	3.3
INGR	15,13	7.23	INTERGRAPH CORP.	8.44	0.19	2.3
LEAF	9.38	1.13	INTERLEAF INC.	1.44	0.05	4.5
ISL1	16.38	6.75	INTERSOLV INC.	7.00	-0.13	-1.8
INTU	55.75	20.88	INTUIT INC.	22.63	0.37	1.4
TLC	30.31	5.50	LEARNING CO. (THE)	6.63	-0.75	-10.2
LGWX	22.25	5.00	LogicWorks	5.00	-0.63	-11.1
MAPS	18.00	7.50	MAPINFO CORP.	9.25	0.88	10.4
MATH	5.83	2.31	MATHSOFT	2.63	-0.13	-6.5
MCAF	65.50	23.63	McAree Associates	43.94	-0.87	-1.8
MENT	18.50	6.83	MENTOR GRAPHICS (L)	7.31	-0.06	-0.8
MIFGY	22.13	9.75	Micro Focus (H)	22.13	1.88	9.3
MGXI	18.53	4.00	MICROGRAFE INC.	6.00	0.31	5.5
MSFT	106.63	52.00	MICROSOFT CORP.	106.63	11.25	11.8
ORCL	51.00	29.75	QRACLE CORP.	36.75	0.19	0.5
PMTC	64.25	34.88	PARAMETRIC TECHNOLOGY	41.00	-0.38	-0.9
PARQ	14.63	1.19	PARCPLACE SYSTEMS INC.	1.38	-0.13	-8.3
PSFT	56.75	25.50	PEOPLESOFT	35.60	1.63	4.8
PTEC	20.38	11.25	PHOENIX TECHNOLOGIES	11.38	-1.00	-8.1
PSOL	13.75	5.50	PLATINUM SOFTWARE	9.38	0.38	4.2
PLAT	18.75	9.25	PLATINUM TECHNOLOGY	11.81	0.56	5.0
PRGS	23.00	12.13	PROGRESS SOFTWARE CORP.	16.38	6.13	0.8
ENBO	24.00	14.63	RAINBOW TECHNOLOGIES INC.	15.58	-1.75	-10.1

Ехсн	52-Week	RANCE		Ares, 18	WinNer	Wit Pcr	
				2 PM	CHANGE	CHANGE	
SAPE	58.25	29.75	SAPIENT CORP.	37.00	3.00	3.3	
SCOC	9.13	4.23	SCD Nuc.	4.81	0.13	2.7	
SDTI	54.30	21.00	SECURITY DYNAMICS TECH.	28.50	1.25	4.6	
SOTA	19.75	9.88	STATE OF THE ART	9.50	-0.13	-1.3	
SSW	81.38	27.25	STERLING SOTIWARE INC.	28.38	-0.25	-0.9	
SDRC	36,63	15.00	STRUCT, DYNAMICS RESEARCH	21.63	1.38	6.8	
SYBS	27.75	12,13	SYBASE INC.	15.44	2.44	18.8	
SYMIC	19.38	8.75	SYMANTIC CORP.	14.81	-0.05	-0.6	
SNPS	50.50	21.75	SYNOPSYS	28.63	4.13	16.8	
SSAX	25.00	3.88	SYSTEM SOFTWARE ASSOC. (L)	4.31	-0.25	-5.5	
SYSE	16.50	7.63	SYSTEMSOFT CORP.	8.63	0.13	1.5	
THUV	9.63	2.19	TRUEVISION CORP.	2.19	-0.64	-16.7	
VIEW	17.30	8.38	ViewLogic Systems	14.69	1,09	13.0	
VMRK	12.63	5.50	VMARK SOFTWARE INC.	6.50	-0.13	-1.9	
WALK	15.63	9.38	WALKER INTERACTIVE SYSTEMS	12.38	0.38	3.1	
WALL	27.50	12.25	WALL DATA INC.	18.94	2.56	15.6	
WANG	26.13	15.38	WANG LABORATORIES INC.	19.25	1.56	8.8	
fee	-			9	OF AL	One.	l
ACI	49.50	22.20	Assess On Loss	45.50	AVO	11	

QDEK	17.38	2.00	QUARTERDECK CORF.	2.69	0.19	7.5
RAPT	38.50	10.88	RAPTOR SYSTEMS (L)	11.38	-2.38	-17.3
SCUR	38.25	4.75	SECURE COMPUTING CORP.	5,75	-0.38	-6.1
SPYC	34.88	6.00	Spyglass Inc. (L)	6.88	0.50	7.8
чноо	37.38	15.50	YAHOO! INC.	31.25	-1.75	-5.3
58	-	-		- m	ar it.	25%
AMD	48.50	10.25	ADVANCED MICRO DEVICES	38.00	1.00	2.7
ADI	29.25	12.75	ANALOG DEVICES INC.	24.75	1.13	4.8
CHPS	26.30	8.88	CHIPS AND TECHNOLOGIES	9.38	-1.38	-12.8
CRUS	25.25	10.63	Cimnus Logic	11.25	-1.38	-10.9
CA	15.63	9.13	CYPRESS SEMICONDUCTOR CORP.	13.25	0.25	1.9
CYRX	36.30	11.50	Cynox	21.38	2.75	14.8
INTO	165.00	63.00	Rettel Coap.	139.13	3.88	6.8
LSCC	54.88	19.75	LATTICE SEMICONDUCTOR	50.25	3.25	6.9
12.5	42.38	17.00	LSI Logic Coap.	37.75	0.00	0.8
MCRL.	41.50	12.00	Місякі Ѕамісонацетов Імс.	36.75	0.50	1.4
MU	45.25	16.63	MICRON TECHNOLOGY	36.73	-2.75	-7.0
MOT	69.75	44.13	MOYOROLA INC.	57.73	-0.50	-0.9
NSM	32.25	13.00	NATIONAL SEMICONDUCTOR	27.88	1.38	5.2
TXN	89.38	40.50	TEXAS INSTRUMENTS	83.88	3.38	4.2
VLSI	29.25	10.38	VLSI TECHNOLOGY	19.06	1.19	6.6
XLNX	53.50	24.50	XILINOX	49.00	2.63	5.7
ZLC	40.38	14.88	Zinos Iwc.	23.25	1.88	2.2

	40.30		41104	0.000	*******	-
200	-		(Amountain)	-	UP 1,	
ADPT	46.83	17.50	Amaptec Inc.	34.88	0.31	0.9
APCC	31.98	8.50	AMERICAN POWER CONVERSION	22.00	1.25	6.0
CREX	7.63	1.19	CAMBEX CORP.	1.19	-0.06	-5.0
CREAF	15.13	3.50	CREATIVE TECHNOLOGY LTD.	13.13	1.50	12.9
RACE	24.50	3.88	Data Race Noc	12.50	1.38	12.4
DTM	12.50	4.88	DATARAM CORP.	9.50	0.00	0.0
EMC	41.75	16.50	EMC Coap.	35.13	-2.38	-6.3
EMLX	21.38	12.88	EMULEX CORP.	17.50	0.75	4.5
ESCC	29.00	19.50	EVANS AND SUTHERLAND	23.00	0.13	-0.5
EXBT	22.75	9.50	EXABYTE	13.88	1.00	7.8
HSLF	4.13	7.38	INVELLIGENT IMPO. SYSTEMS	1.38	-0.06	-4.3
MOI	55.13	12.63	IOMEGA CORP.	17.50	0.00	0.0
IPLS	3.25	1.25	IPL Systems INC.	1.63	-0.25	-13.3
KMAG	37.00	17.63	Komag Inc.	29.60	0.56	2.0
METSI	29.75	12.88	MICRO FOUCH SYSTEMS INC.	18.63	-1.25	-6.3
PEAK	27.50	8.50	PEARTECHNOLOGY GROUP	12.50	0.75	6.4
PNCL	12.00	1.50	PINNACLE MICEO INC. (L)	1.50	-0.50	-23.0
AQM	6.75	3.75	QMS Inc.	4.13	-0.13	-2.9
ONTM	48.13	10.98	QUANTUM CORP.	42.88	0.25	0.5
RDUS	4.88	0.25	Raprus Inc.	0.44	0.13	49.0
SEG	56.25	18.13	SEAGATE TECHNOLOGY	44.50	-0.50	-1.1
STK	54.38	24.00	SYDRAGE TECHNOLOGY	38.63	0.73	2.0
STLC	3.75	0.50	STREAMLOGIC CORP. (L)	6.50	-0.06	-11.1
TEK	53.75	34.13	Тектномих Імс.	53.00	0.75	1.4
WDC	77.25	19.00	WESTERN DIGITAL CORP.	63.13	1.63	2.6
XXXX	63.25	43.33	XEROX CORP.	58.75	2.63	4.7
100	-				NAME OF	

	tion.				-	-
AMSY	37.13	15.75	AMERICAN MGMT, SYSTEMS	21.75	2.63	13.7
ANLY	30.50	17.13	AMALYSTS INT'L	24.38	-1.63	4.3
AUD	45.75	35.63	Auto Data Processing	42.88	1.63	3.9
BOM	30.75	19.75	BDM INTERNATIONALING	23.75	1.25	5.6
CATP	17.25	18.75	CAMBRIDGE TECH. PARTNERS	25.63	1.87	7.6
CEN	54.88	29.50	CERIDIAN CORP. (L)	32.00	2.00	6.7
CDO	13.00	21.25	Сомонясо Інс.	28.75	0.00	0.0
CPU	30.88	13.25	CoweUSA Inc.	16.88	-1.25	4.9
CHIEZ	54.00	15.00	Соммитея Нопігона	38.13	2.63	7.6
CSC	86.50	69.25	COMPUTER SCIENCES	61.38	-0.75	-1.2
TSK	47.50	22.39	COMPUTER TASK GROUP	44.38	2.38	5.7
CDAT	28.63	12.75	CONTROL DATA SYSTEMS INC.	14.63	-0.38	-2.5
EGGS	13.88	3.63	EGGHEAD DISCOUNT SOFTWARE (L)	3.75	-0.38	-9.3
EDS	63.38	38.13	ELECTRONIC DATA SYSTEMS CORP.	39.38	0.25	0.6
INAC	40.63	13.38	Імасам Совр.	23.50	1.73	7.4
INEL	11.30	2.81	INTELLIGENT ELECTRONICS	3.13	-0.31	-9.1
KEA	42.38	14.98	Keane Inc. (H)	42.38	6.13	16.9
MICA	25.00	9.63	Microage Inc.	13.25	-0.13	-0.9
PAYX	63.63	38.25	PAYCHEX	46.69	2.23	5.7
PMS	53.50	33.13	POLICY MANAGEMENT SYS.	43.88	0.23	0.6
REY	30.63	21.25	REYNOLDS AND REYNOLDS (L)	22.50	-0.38	-1.6
SCBI	30.50	14.44	SCB COMPUTER TECH. INC.	17.00	-0.25	-3.4
SEIC	26.38	17.75	SEI CORP.	20.13	-0.63	-3.0
SMED	71.38	38.00	SHARED MEDICAL SYSTEMS (L)	38.00	-5.80	-11.6
SSPE	33.50	13.06	SOFTWARE SPECTRUM INC. (IL)	13.31	0.56	-4.1
SNDT	50.75	37.25	SUMGARD DATA SYSTEMS	43.25	-1.19	-2.7
VST	29.75	6.50	VANSTAR CORP. (L)	7.30	0.38	5.3

KEY: (H) = New annual high reached in period (L) = New annual loss reached in period
Copyright Nordby International, Inc., Boulder, Colo.

This information is based on sources believed to be reliable, and while extensive efforts are made to assure its accuracy, no guarantees can be made. Nordby International and Computerworld assume no liability for inaccuracies. For information on Nordby's customized financial research services, call (303) 938-1877.

Network software that's well-designed, well-implemented and well-reviewed.

"Best enterprise management software of 1996."

- Infoworld praises Solstice™ Enterprise Manager™ software*

"Solaris is a highly scalable, powerful and flexible OS well suited to general Internet service and enterprisewide intranet services."

- Network Computing raves about Sun™ Solaris™ operating environment*

"Many new Java™ development tools were released this year, but none as radical as Sun's Java™ Workshop.™"

- PC Magazine honors Java WorkShop Software⁺

And there's a whole lot more where that came from. To see for yourself, visit our website or give us a call.

Develop, deploy and manage with Sun™ Workshop,™ Solaris, and Solstice™ Software.

www.sun.com/sunsoft/reviews/ or contact 1-800-SUNSOFT (786-7638)



THE NETWORK IS THE COMPUTER"

How to contact Computerworld

Main phone number ... (508) 879-0700 All editors unless otherwise noted below . (508) 875-8931 24-hour news tip line ... (508) 820-8555

Our Web address is www.computerworld.com. All staff members can be reached via E-mail on the Internet using the form:

firstname_lastname@cw.com. All IDG News Service correspondents can be reached using the form: firstname_lastname@idg.com.

LETTERS TO THE EDITOR

Letters to the editor are welcome and should be

letters@cw.com.

Please include your address and telephone number.

MAIL ADDRESS

PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701

SUBSCRIPTION/BACK ISSUES		
Phone	(800) 669-1002	
E-mail circu	lation@cw.com.	
Back Issues	. (508) 820-8129	

Michelle Olk, (800) 217-7874

CONTACTING CW EDITORS

We invite our readers to call or write with comm and ideas. It is best to submit ideas to one of the department editors as well as to the appropriate beat reporter.

Editor Paul Gillin (508) 620-7724 Executive Editor Maryfran Johnson (508) 820-8179

DEPARTMENT EDITORS/NEWS

News Editor Patricia Keefe (508) 820-8183
Sections Editor Kevin Fogarty (508) 820-8246
Assistant News Editor Neal Weinberg (508) 820-8274
Assistant News Editor Michael Goldberg (508) 820-8778
Assistant Sections Editor Michael Goldberg (508) 620-7789 Online Editor Johanna Ambrosio (508) 820-8553 Online News Editor Judith H. Bernstein (516) 266-2863

SENIOR EDITORS/NEWS

Groupwan, E-mail, messaging Barb Cole-Gomolski (760) 728-8858 LANs, operating systems Laura DiDio (508) 82-0-8182 Network/systems management Patrick Dryden (817) 924-5485 Application development Sharon Gaudin (508) 820-8122 IS management Thomas Hoffman (201) 587-0090
IS careers Julia King (610) 532-7599
Investigative reports Kim S. Nash (214) 716-9822
Apple, software suites Lisa Picarille (415) 347-0555

Databases Craig Stedman (508) 820-8120 Midrange hardware, Jaikumar Vijayan (508) 820-8220

Internetworking Bob Wallace (508) 820-8214 SENIOR WRITERS/NEWS

Mobile computing, Mindy Blodgett (508) 820-8168

PCs, servers, net computers April Jacobs (508) 820-8121 Security, government Sharon Machlis (508) 820-8231 tainframes, high-end storage Tim Quellette (508) 820-8235

STAFF WRITERS/NEWS

⊕Computerworld Stewart Deck (508) 820-8155 fecommunications Kim Girard (508) 820-8223 New products. Matt Hamblen (soil) 820-8567 New provision, india, low-end storage [ustin Hibbard (415) 548-5515 [Intranets [ustin Hibbard (415) 548-5515]

@Computerworld Patrick Thibodeau (508) 820-81 m/server software, Randy Weston (508) 628-4869 Unix apps

@Computerworld Wylie Wong (415) 548-5581

Columns Editors Kevin Fogarty (508) 820-8246 Michael Goldberg (508) 620-7789 Steve Ulfelder (508) 620-7745 Staff Columnist Frank Haves (503) 252-01

nology reviews/ James Connolly (508) 820-8144 Buyer's Guide

Buyer's Guide Cathleen Gagne (508) 620-7729 Careers David B. Weldon (508) 820-8166 In Depth Steve Ulfelder (508) 620-7745 Management Robert L. Scheier (508) 628-4931

Managing Allan E. Alter (508) 620-7714

Special reports Gary H. Anthes (202) 347-0134

ASSOCIATE EDITORS/FEATURES

Managing Rick Saia (508) 820-8118 Buyer's Guide Amy Walloy (508) 620-7754

IDG News Service Correspondents

Paris bureau chief Jeanette Borzo (33) 1-4904-8001 Paris bureau chief
| UK correspondent | Krist Essick (44) 71-416-0701
| Rong bureau chief | On Skillings (852) 2535-4661
| Tokyo correspondent | Rob Guth (81) 33-358-6122

RESEARCH

Bob Fink, senior research manager (508) 820-8116; Kevin Burden, senior researcher; Laura Hunt, research analyst; Stefanie McCann, senior graphics coordina-Bob Fink, senior re tor; Mari Keefe, online researcher.

COPY DESK

Ellen Fanning, managing editor (508) 820-8174: Roberta Fusaro, assistant managing editor; Christina Aicardi Maguire, Jamie Eckle, senior copy editors; Michelle Davidson, Kimberly Gilliard, Senior copy editors.

Michelle Davidson, Kimberly Gilliard, Senior production copy editors; Pat Hyde, David Ramel, Jerem Selwyn, Keith Shaw, copy editors; Scott Burnell Monica Sambstaro, online copy editors.

GRAPHIC DESIGN

Tom Monahan, design director (so8) 820-8218; tanell Genovese, Mitchell J. Hayes, Nancy Kowal, senior graphic designers; Carol Lieb, photo researcher/ editor; Amira Harari, David Waugh, Mary Beth Welch, graphic designers; Rich Tennant, John Klossner,

Linda Gorgone, office manager (est. \$176); Connie Brown (ext. \$178), Lorraine Witzell (ext. \$139); Rita Jones (ext. 8172), editorial assistants; Chris Flan West Const editorial assistant. (415) 548-5552 rial assistant, (415) 548-5563.

(Includes Premier 100, Campus Edition, Best Places to Work, Leadership Series, Intranet Series, Emmerce and Health Care Journal.)

Alan Alper, editor (508) 820-8115; Mary Brandel, esscu-tive editor; Anne McCrory, Catherine McCrorey, Joyce Chutchian-Ferranti, manging editors; Kimberlee A. Smith, assistant managing editor and online coordina-tor; Stephanie Faucher, art director.

· COMPUTERWORLD

@Computerworld is our World Wide Web site. On it, we publish daily news and feature stories that supplement our print coverage. We also have special audio features, such as interviews with industry notables, and the @Computerworld Minute, which is an audio version of the day's top news.

A few times each week, we also have Links listings. These are resources related to online and/ or print stories. We also have polls and forums that you must register for to access. The rest of the site is accessible without registering.

Contact: Johanna Ambrosio, Online Editor, (508) 820-8553 or johanna_ambrosio@cw.com.

Companies in this issue

Page number refers to page on which story begins. Company names can also be searched at www.computerworld.com.

3Com Corp
Actra 4
Adaptive information Systems for AV
reapare moment systems; me
ADC Kentrox51
Aetna, Inc
Alberto-Culver USA, Inc47
Alden Buick Pontiac51
Align Solutions Corp
Allied Group 106
Amdahl Corp 92
America Online, Inc 59,127
American Express Co 4
American Hospital Association 17
American Mathematical Society 6
Amoco Corp47
Amoco Customer Service Center 106
Andersen Consulting63
Apple Computer, Inc3,14,32,129
Ascend Communications, Inc32
AstraTek Corp12
AT&T Corp127
Automobile Club of
Southern California91
AutoZone, Inc47
Avant Corp
Azent Technologies, Inc16
Banc One Corp47
BankAmerica Corp71
Bay Networks, Inc16
BEA Systems, Inc4
Black & Decker Corp
Black Diamond Consulting47
Blue Cross/Blue Shield of lows 106
Blue Water Systems, Inc 55
Brewers Retail, Inc
Bristol-Myers Squibb Co51
British Airways 29
British Steel PLC
BSG Alliance/IT63
Bull HN Information Systems, Inc 3.43
Burger King Corp
BYR LLC
BVR LLC
Cadence Design Systems, Inc
Combridge Technology Partners, Inc65
Camelot IS-2 International LLC G8

CareGroup
CAST Software, Inc32
CertiSource, Inc63
Charles River Computers63
Charles Schwab & Co
Check Point Software
Technologies Ltd 16
Cheyenne Software16
Chrysler Corn 80
Chrysler Corp
Cisco Systems, Inc
Clarify Inc
Claris Corp32
Collaborative Strategies95
Commonwealth Edison Co3
Compag Computer
Corp14,43,83,84,85,127,129
Corp14,43,43,44,65,127,129
Computer Associates International, Inc
Concord Communications, Inc
Connected Corp
Cox Target Media
Cray Research, IncCover 1
Creative Networks, IncCover 1,51
Creative Strategies, Inc
Credit Suiese First Boston Corp32
CyberGuard Corp 68
Cyrano, Inc12
Dana Corp
DataFocus, Inc4
Data General Corp8
Dataquest2,43,91
Dataware Technologies, Inc63
Dell Computer Corp 14.43,83,84
Deloitte & Touche63
Deloitte & Touche
47.71.84.85.01.120
Dr. Solomon's Software16
Dunlop Tire Co
Dunsgale
EC Cubed. Inc
EMC Corp4
Emergent Corp
EMI Records, Inc10
Facon America, Inc
Front & Young
Ernet & Young
Federal Express Corp59

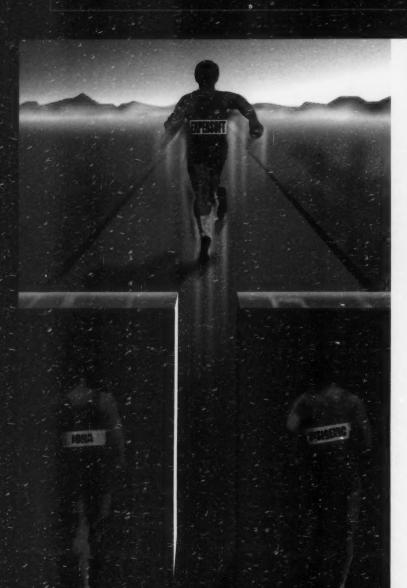
	16,63
Ferris Networks, Inc	137
Firstar Corp.	68
Fisery, Inc.	
Ford Motor Co.	
Fractal Design Corp	60
Frost & Sullivan, Inc.	43
Fujitsu-ICi. Systems, Inc.	
Gartner Group, IncCover	11.414
Geac Computer Corp	60
General Electric Co	480
General Motors Corp.	
Genesee Management, Inc.	9.4
Gensym Corp.	
Geodesic Systems LLC	OB
Combas Stactais Company Inc	
Graybar Electric Company, Inc Hardware Wholesalers, Inc	4-
Harrah's Entertainment, Inc	03
Haystack Labs, Inc.	10
Maystack Labs, Inc.	10
HBO & Co	(7)
HBO & Co	0,38,34
Hitachi Data Systems Corp.	91,129
Hughes, Fubbard and Reed	92
Frugnes, Prusourd and mees	ones life
Hurwitz Group, Inc.	67
Hurwitz Group, Inc.	(7
Hurwitz Group, Inc. L D. Centric	
Hurwitz Group, Inc. L D. Centric	
Hurwitz Group, Inc	47 71 1,14,43 91 R4,139
Hurwitz Group, Inc. 1. D. Centric IBM PC Co. Cover IBM Printing Systems Co. IBM . 3,4,8,10,14,16,29,43,47,83. Idaho Power Co.	47 71 1,14,43 91 &4,139 16
Hurwitz Group, Inc. 1. D. Centric IBM PC Co. Cover IBM Printing Systems Co. IBM 3,4,8,10,14,16,29,43,47,83; idaho Power Co. IBuminast, Inc.	47 71 1,14,43 91 E4,129 16
Hurwitz Group, Inc. L D. Cantric ISM PC Co. Cover ISM Printing Systems Co. ISM	47 71 1,14,43 91 84,139 16 71
Hurwitz Group, Inc. L D. Cantric ISM PC Co. Cover ISM Printing Systems Co. ISM	47 71 1,14,43 91 84,139 16 71
Hurreltz Group, Inc. L.D. Centric BMA PC Co. BMA Printing Systems Co. BMA Printing Systems Co. BMA14,6,10,4,16,29,43,47,83,1daho Power Co. Blumhata, Inc. In Pocas Systems, Inc. Industri-Matematik Listernational Corp.	
Hurreliz Group, Inc. L. D. Cantric IBM PFC Co. IBM PFC Co. Cover IBM Printing Systems Co. IBM — 3,4,8,10,14,16,19,43,47,83,164.he Power Co. IBminista, Inc. Infocus Systems, Inc. Industri-Maternilli Literrational Corp.	
Hurrolitz Group, Inc. L. D. Cartric IBM PFC Co. IBM PFC Co. IBM Printing Systems Co. IBM — J.4,8,70,14,16,19,43,47,83, IBM minista, Inc. In Geous Systems, Inc. Industri-Matematik citerrational Corp. Informis Software, Inc.	
Hurrolitz Group, Inc. L. D. Cartric IBM PFC Co. IBM PFC Co. IBM Printing Systems Co. IBM — J.4,8,70,14,16,19,43,47,83, IBM minista, Inc. In Geous Systems, Inc. Industri-Matematik citerrational Corp. Informis Software, Inc.	
Hurwitz Group, Inc. L. D. Centric BM PC Co. BM PC Co. BM PC Co. BM Printing Systems Co. BM — Ja, 4, 3, 0, 1, 4, 1, 5, 3, 4, 3, 4, 7, 3, 1 Bhar Power Co. Burninsta, Inc. In Focus Systems, Inc. Industri-Malammilli International Corp. Informit Software, Inc. Industriance Corp. Informit Software, Inc. Industriance Corp. Informit Software, Inc. Industriance Corp. Indust	
Hurwitz Group, Inc. D. Cestric BM PC Co. BM PC Co. BM PC Co. BM Printing Systems Co. BM — Ju-8, 10,14,16,19,43,47,83,48h Power Co. Bluminath, Inc. In Focus Systems, Inc. Burdinath, Inc. Industri-Maternelli Listerational Corp. Informit Software, Inc. Bright Software, Inc. Intelliging Softwar	
Hurwitz Group, Inc. D. Cestric BM PC Co. BM PC Co. BM PC Co. BM Printing Systems Co. BM — Ju-8, 10,14,16,19,43,47,83,48h Power Co. Bluminath, Inc. In Focus Systems, Inc. Burdinath, Inc. Industri-Maternelli Listerational Corp. Informit Software, Inc. Bright Software, Inc. Intelliging Softwar	
Hurwitz Group, Inc. D. Castric BM PC Co. BM PC Co. BM PC Co. BM Pining Systems Co. BM - Jud. 10,14,16,19,43,47,73,146h Power Co. Bluminata, Inc. In Focus Systems, Inc. Burdinata, Inc. Industri-Maternelli Listerational Corp. Informit Software, Inc. Burdinata, Inc. Listerational Corp. Li	
Hurwitz Group, Inc. D. Castric BIA P.C.Co.	
Hurwitz Group, Inc. D. Centric BM PC Co. BM PC Co. BM PC Co. BM Pinting Systems Co. BM — Jud, 810, 14, 16, 19, 43, 47, 32, 48, 10, 14, 16, 19, 43, 47, 32, 48, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10	
Hurwitz Group, Inc. D. Centric BM PC Co. BM PC Co. BM PC Co. BM Pinting Systems Co. BM — Jud, 810, 14, 16, 19, 43, 47, 32, 48, 10, 14, 16, 19, 43, 47, 32, 48, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10	
Hurwitz Group, Inc. L. D. Centric BM PC Co. BM PC Co. BM PC Co. BM Pinting Systems Co. BM Inc. BM Pinting Systems Co. BM Inc. BM Pinting Systems Co. Bluminath, Inc. In Focus Systems, Inc. Industri-Maternatil Listernational Corp. Informit Software, Inc. Informit Software, Inc. Intelligiz Software, Inc. Intelligiz Software, Inc. Intelligiz Software Intelligiz Softwa	
Hurwitz Group, Inc. D. Centric BM PC Co. BM PC Co. BM PC Co. BM Pinting Systems Co. BM — Jud, 810, 14, 16, 19, 43, 47, 32, 48, 10, 14, 16, 19, 43, 47, 32, 48, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10	

Kansas City Power & Light Co	99
Kaspia Systems, Inc Knight-Ridder MediaStream	6,51
Knight-Ridder MediaStream	4
Krause Publications, Inc	16
Legato Systems, Inc.	
Lexmark International, Inc.	91
Lithonia Lighting	44
Lithonia Lighting Lockheed Martin Corp	6
Lotus	
Devalopment CorpCover	4 10.00
Madge Networks, Inc	1011-021
Mail Boxes Etc. USA, Inc	
Manualatics Inc	20
Manugistics, Inc	
staration recinologies corp	31
Interior Performance Improvement Co. Marriott International, Inc.	
Improvement Co.	
Marnott International, Inc	1,59
MathSoft, Inc	71
McDonnell Aircraft	10
McDonnell Aircraft	129
MCI Systemhouse	68
Merrill Lynch & Co	63
Merrill Lynch & Co	3,16,29
Microsoft Corp Cover 1,	2,6,8,10
14,16,29,43,47,51,59,8	5,91,129
Millipore, Inc	14
Montgomery Securities, Inc	14
National Institutes of Health	29
Navio Communications, Inc	4
NCR Corp	71
NEC Technologies, Inc	WEF1,34
Nets, Inc.	4
Netscape	
Communications Corp4,10,	16,47,51
NetScout Systems, Inc	6
Natural Computer, Inc	
New Alliance Corp	
New Alliance Corp	13
Next Software, Inc	13
Next Software, Inc	13 32 71
Next Software, Inc	13 32 71
Next Software, Inc. Nine West Group, Inc. Nakia Northern States Power Co.	13
Next Software, Inc	32 37 43 14 14
Next Software, Inc	13 32 14 14 14 14
Next Software, Inc	13 32 14 14 14 14
Next Software, Inc	
Nant Software, Inc. Nine West Group, Inc. Neither Northern States Power Co. Narthern Trust Co. Narthern Trust Co. Novell, Inc. OviDisplay Oracle Applications User Group.	
Next Software, Inc	13 32 32 34 34 47,51-59 60 60 11 6,12,17

PaineWebber, Inc31	t
Patricia Seybold Group	ľ
PDS Technologies LLC	ı
Pennzoii Co	
Perot Systems Corp	ı
Pfizer, Inc	ì
Pfizer, Inc	
Phoenix Technologies Ltd	į
Polaroid Corp	ı
Procept Software, Inc	,
Prestice Hall, Inc	ŝ
Quarterdeck Corp	ı
Rapport Communication Cover	
Red Brick Systems, Inc	í
Remedy Corp	,
Robert Half International, Inc 24	į
RSA Data Security, Inc16	į
Sable, Makoroff& Gusky 44	į
SafeGuard Interactive, Inc	ļ
Safeway, Inc4	į
SAP AG 8,29,61	ļ
SCO, Inc	ř
Scopus Technology Corp 29	þ
Sears, Roebuck and Co7	K
Secure Computing Corp16	ì
Security Dynamics, Inc	
Sequent Computer Systems, Inc 12,71	ı
Sharp Electronics Corp4	Ì
Shell Offshore, Inc4	ļ
Silicon Graphics, Inc Cover 1,4,76,139)
Silicon Graphics, inc Cover 1,4,7 6,129 Silyway Freight Systems, loc)
Softway Systems, Inc	þ
Source Informatics	þ
Spectral Electronics Corp91	
Stac, Inc	
Star Enterprises	þ
State Stroet Bank and Trust Co	
Stollar Dynamics	
Storage Technology Corp4	į
Strategic Network	
Consulting, Inc	,
sun microsystems, Inc Cover 1,4,14	ĺ
Sun Oil Co	
San Off Co	
SunRiver Corp	í
Sypase, Inc12,47,83,9	į
Symamoc Corp	

Systems and Computer	
Technology Corp 24	۰
SystemSoft Corp	
Taco Bell Corp.	
Tandens Computers, Inc	1
Tachnically Elita Inc	ē
Technically Elite, Inc	
Toktoniu Inc	2
Toward lor Count 1 68 7	å
Tektronix, Inc	
The Clinger Group Inc	-
The Clipper Group, Inc	i
The Phillips Petroleum Co	ä
The Principal Financial Group 101	ä
The Presistant Inc.	ä
The Registry, Inc	ű
The Yankee Group	ã
Thomson Financial Services, Inc 2	2
Tibes Inc.	2
Tibco, Inc	r
taformation Systems, Inc Cover 1,1.	L
TPN Register	
TradeWave Corp	3
U.S. Robotics Corp	ä
Ukish Software, Inc.	
Union Com	ă
Unisys Corp	ā
Universal Press Syndicate9	2
U.S. Fidality and Guaranty Co.	ä
US West Communications, Inc \$1,10	ä
US West, Inc	a
USWeb Corp	ä
Ventive Corp 3	8
VeriSign, Inc.	ð
Videonics, Inc	8
Visual Networks, Inc	ē
VLSI Technology, Inc	å
Wang/I-NET Government Services 16,6	4
Want Ad Publications, Inc5	8
Walls Fargo & Co	8
Western Sugar Co	ä
Wheat First Butcher Singer	р
Workgroup Strategic Services, Inc	12
Worthington Industries, Inc	ij
Wyse Technology12	ä
Xerox Corp	12
Xtend Micro Products, Inc	ä
Xylan Corp	Ħ

Very BALELENISB ADDITIONS, sooner or later you're going to NAL & WALL



Most ORBs run into scalability barriers long before your deployments are complete. Only Expersoft[®] gives you the power to fully deploy your enterpriseclass distributed applications far beyond those limits.

That's because only Expersoft's PowerBroker™
CORBAplus products deliver the reliability, performance, and scalability you need for real-world, business-critical deployments. What's more, Expersoft provides the most comprehensive suite of CORBA 2.0-compliant services available today.



Why else would organizations like Allstate Insurance, NationsBank, Lucent, the State of Maine, and Delta Airlines/TransQuest rely on Expersoft for their distributed computing needs?

Truth is, Iona and Visigenic simply can't match Expersoft's track record of successful enterprise-level deployments.

So, whether you're building a three-tier, client/server application, or a distributed application for your Intranet, only Expersoft will keep you from hitting a wall.

To find out just how well Expersoft stacks up against the competition, visit the new "Get Competitive" page on our Web site at www.expersoft.com. Then call us at 800-527-0590, ext. AWA and start making large deployments a reality.

EXPERSOFT Distributed Objects For The Enterprise

E-mail us at PowerBroker@expersoft.com or visit our Web site at www.expersoft.com

ing number of business departments are turning to information systems to formulate stricter policies for E-mail use.

About 2.6 trillion E-mail messages will move through U.S.based networks this year, up from 1.65 trillion last year, according to the Electronic Messaging Association (EMA) in Arlington, Va.

The number of E-mail users in the U.S. is expected to climb from 37 million last year to nearly 50 million this year, according to the EMA. Total E-mail sent per person - including each version of a message that is sent to more than one person - is expected to jump from 190 per week last year to 300 per week by 2000.

So far, corporate E-mail policies have focused largely on protecting companies from legal pitfalls that could arise from the content of E-mail. For example, an E-mail policy might spell out that employees aren't to use the system to find a new job, seek a date or post personal views in a public Internet forum.

But recent E-mail policies are

@ COMPUTERWORLD

For these and other privacy

links, point your browser at computerworld.com /finks/

- The Cyberiaw Encyclopedia

policy.htm

Guidelines and issues concern

vw.gahtan.com/techlaw/

g corporate E-mail policies

and employee rights.

- Company E-mail Policy — other resource links from the

E-mail privacy rights at your

Company's Policy

policy from the EMA.

v.eme.org/html/pubs/

es issues surrounding eshment of an E-mail privacy

oce Law Institute

20semail-links.html

DAILY E-MAIL STATS

- Average worker sends about 18 messages
- Average worker receives about 39 messages
- 20% of the messages received have attachments

Source: Creative Networks, Inc., Palo Alto, Calif.

more likely to include restrictions on message size and type and even the time of day that messages can be sent, users and analysts said

Business concerns abound that excessive E-mail can curb employee productivity, bog down the network and enslave desk workers.

TOO IMPERSONAL

"In our company, the pendulum swung too far to where people did everything by E-mail and nobody saw each other any more," said David Frost, IS capability leader at Owens Corning in Toledo, Ohio.

Joyce Graff, an analyst at Gartner Group, Inc. in Stamford, Conn., estimated that bandwidth consumption at most companies will double at least once per year, in part because of E-mail's growing popularity.

Also worrisome are workers who use E-mail to write to friends and relatives or to avoid in-person contact with customers and co-workers.

"With E-mail, there is a tradeoff," said Ron Rassner, vice president of consulting and market research at Creative Networks, Inc., a consultancy in Palo Alto, Calif. E-mail makes workers more productive, Rassner said, but research at 75 companies showed that workers waste about 30% of the estimated time they save using E-mail.

"They're going home early, surfing the Web, writing to friends," Rassner said. Indeed, one messaging manager estimated that 20% to 30% of the company's E-mail traffic is personal in nature.

With an eye on E-mail's downside, companies such as Owens Corning are tacking a 1.5M-byte limit on E-mail attachments. The limit is enough to handle more than 100 pages of text, but it could be chewed up quickly by a graphics file.

The policy has gone over well with end users, largely because it is delicately enforced, Frost said. In the same way, the company tracks the top 100 diskspace consumers and gently reminds them to clean out mail

"We've gone back to them and said, 'Are you aware that you are using this much disk space?" Frost said. "Mostly, we're finding people are unaware.

Aetna, Inc. is close to banning all incoming and outgoing Email attachments because of the strain they put on the network.

"If we do this, we'll simply tell users to use a [uniform resource locator] to point to a document instead of sending it over the network," said John Brighton, deputy chief information officer at the Hartford, Conn.based company.

Gary Rowe, a principal at Rapport Communication in Roswell, Ga., said one goal of an Email policy is to prevent a couple of big messages from tying up 10,000 users.

"There's always the story of somebody who tried to send a 10M-byte PowerPoint file that had screen shots embedded,"

Met managers seek E-mail solutions

Greater volumes of E-mail and the increasing size of messages are forcing some network managers to invest more money in the redesign and structure of corporate networks.

Gary Rowe, a principal at Rapport Communication, said more companies are standardizing on TCP/IP in order to boost bandwidth for messaging and for intranet applications. They also are in-stalling separate servers and mailboxes to handle the crush of

The FAA recently changed its messaging network topology so that mail sent from subordinate offices is no longer routed through a main hub. That has resulted in a 20% traffic reduction on that hub, according to Paul Evans, an analyst at the FAA.

A big headache for corporations can be supporting remote users who are downloading E-mail via skimpy, low-bandwidth lines. On the LAN, the corporate backbone is typically robust enough to handle E-mail traffic. But telecommuters and users in branch offices don't have it so easy and often are left waiting while large files take many minutes to download.

One answer is to use an E-mail client that notes the message size in the header so users can skip over big files. Another possible solution is to split incoming mail into two files — one for plain text messages and another for messages with attachments so employees dialing in for E-mail can pick and choose, said Tom Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J.

- Kim Girard and Barb Cole-Gomolski

Rowe said. "You don't want to be over-restrictive, but you don't want a few power users affecting quality of service for every-

Graff added that managers are fooling themselves if they believe they can totally control employees' use of E-mail and incoming E-mail traffic.

A messaging manager at a New York insurance company said trying to control personal use by monitoring the traffic of 35,000 users would cost more than what the company could possibly save by controlling E-

Message deluge drowns servers

▶ MSN's latest service to suffer E-mail woes

By Stewart Deck and Barh Cole-Gomolski

BUSINESSES AND CONSUMERS. increasingly dependent on electronic mail, have clogged networks and overloaded E-mail servers in recent months, cutting off communication.

For example, in November, AT&T Corp.'s WorldNet mail service was down for two days after a server failed, inconveniencing 50,000 subscribers. Two weeks ago, America Online, Inc. had to add mail servers to uncork a 35 million-message E-mail bottleneck that had stranded its 8 million subscribers. It wasn't enough. America Online last week again had to take its E-mail service off-line.

Also hit last week was Microsoft Corp., which shut down The Microsoft Network (MSN) Email service, which has 2.5 million subscribers worldwide.

Microsoft officials said the company had been planning to take down the system at the end of the month to double the number of F-mail servers on the

"Our E-mail servers were running out of space and shutting themselves down for diagnostics."

- Jeff Sanderson, MSN

network, but necessity pushed the plan ahead of schedule. "Our E-mail servers were running out of space and shutting themselves down for diagnossaid Jeff Sanderson, MSN's general manager of marketing. "So we decided to take care of the problem now."

To do that, Microsoft halted all E-mail delivery through MSN, starting last Wednesday afternoon, to add nine Compaq Computer Corp. Pentium Probased mail servers. The goal was to have the service up and running by Friday afternoon.

David Ferris, president of Ferris Networks, Inc., a San Francisco-based research firm, said he wasn't surprised by MSN's troubles. "Right now, the message-store management tools are quite crude," he explained. "Most products revolve around a single server message store. Corporations already have this problem [see story above], but they don't have the volume that [Internet providers] have. The solution is to spread the message store over various ma-

Sanderson said that in addition to adding servers, MSN is looking into other ways to ease the crush.

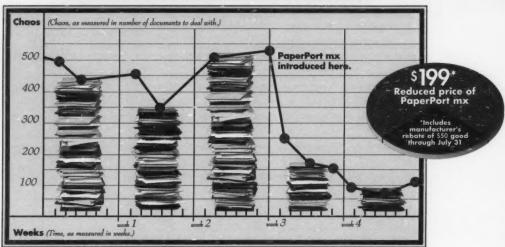
Periodical postage paid at Framingham, Mass., and other mailing offices. Posted under Canadian International Publication agreement #038569; Computerworld (ISSN 0010-484) is published weekly; except a single com Computerworld, Inc., 500 Old Connecticut Path, Box 9179. Framingham, Mass., 0170-1917. Copyright 1939 by Computerworld, Inc. All rights reserved. Computerworld an be purchased on microfilm and microfiche through Arbo, Mich., 4800. Computerworld is indeed. Back is issues, if available, may be purchased from the circutation of department. Photocol, phints: emission to ophicatory by internal of personal use is granted by Computer with the Copyright Clearance Center (CCC.) provided that the base fee of \$9 per copy of the article, plus \$5,0 per page is paid directly to Copyright Clearance Center, 2 Congress \$5., Salem, Mass., 0:1920. Repints (minimum to copies) and permission to reprint may be purchased from Michelle Olic, Computerworld Reprints, c) Repint Servers, \$100 American Center, 2 Congress \$5., Salem, Mass., 0:1920. Repints and the computerworld Reprints, c) Repints and Computerworld Reprints, \$100 American Center, 2 Congress \$5., Salem, Mass., 0:1920. Repints and Computerworld Reprints, \$100 American Center, 2 Congress \$5., Salem, Mass., 0:1920. Repints and Computerworld Reprints, \$100 American Center, 2 Congress \$5., Salem, Mass., 0:1920. Repints and Computerworld Reprints, \$100 American Center, 2 Congress \$5., Salem, Mass., 0:1920. Reprints and Computerworld Reprints, \$100 American Center, 2 Congress \$5., Salem, Mass., 0:1920. Reprints and Computerworld Reprints, \$100 American Center, 2 Congress \$5., Salem, Mass., 0:1920. Reprints and Computerworld Reprints and Computerworld Reprints. \$100 American Center, 2 Congress \$5., Salem, Mass., 0:1920. Reprints and Computerworld Reprints. \$100 American Center, 2 Congress \$5., Salem, Mass., 0:1920. Reprints and Computerworld Reprints. \$100 American Center, 2 Congress \$5., Salem, Mass., 0:1920. Reprints and Congress \$100 American Center, 2 Congress \$5., Salem







THE BUSINESS STRESS-REDUCTION INDEX



Sharp drop in chaos; Analysts suspect new PaperPort mx.

REDUCE ISSUES DOWN TO THEIR ESSENTIALS.

The first step in reducing stress is to rid yourself of unnecessary paper. PaperPort mx can scan thousands of words in minutes—from virtually any type of document. Reports. Memos. Letters. Newspaper articles. So you can more easily deal with them. The result is higher productivity. For instance, Toyota's U.S. marketing division deployed PaperPort in its organization and expects to save considerable time and money.

RE THE GREAT COMMUNICATOR.

Use PaperPort mx to scan wads of information directly into reports, proposals, and e-mails. It will even let you send information over the Net-for instance, that contract (or invoice) that needs immediate attention.

V visioneer

IMPROVE YOUR TIME-MANAGEMENT SKILLS.

Rid your world of unnecessary and time-consuming tasks. For example, retyping. PaperPort mx can handle it for you. Simply take the document you want to retype, and scan it with PaperPort mx. Then PaperPort mx's integrated Xerox TextBridge™ OCR software converts these words to digital format so they can be edited or copied. Literally saving you hours.

MEASURABLE OPERATING RESULTS.

Ah, here's a bonus: PaperPort mx can accomplish all of these thingswithout hogging space on your desk. It's sleek and small and fits right between your keyboard and monitor.



MANAGE TECHNOLOGY.

Here's a secret about how to get the technology you have to work harder. Say you want to send a fax. Scan in your document using PaperPort mx, then send a fax using your computer's modem. It saves time (you'll never again have to trek down the hall to fax something). And it's usually cheaper, to boot.

SIMPLIFY OPERATIONAL STRUCTURES AND SYSTEMS.

For instance, your archaic filing system. Instead, use PaperPort mx. Filing things digitally on your computer takes up far less space, but more than that, it helps you pinpoint a specific document later. Just type in a keyword, and PaperPort mx will retrieve it for you.

ORCHESTRATE THE PROGRAM FOR CHANGE.

Don't let its compact size fool you. PaperPort mx is tough enough for even the toughest business environment. For one, it's fully compatible with Windows NT. And at a new lower price, even the most stringent bean counters in your company will be pleased.



FOR ADVICE ON CHAOS-COPING STRATEGIES

call 1-800-787-7007, extension 803. http://www.visioneer.com

Or contact an authorized reseller.

PAPER PORT mx

COMMENTARY

What keeps Sun awake at night? David Coursey

ow does Sun view the world? I can't say defini- status, but value-adds by companies such tively, because the company doesn't seem organized enough to have a consistent viewpoint on any but the most obvious issues. What I can tell you is what questions the company is asking.

Such questions are often a telling reflection of hopes, dreams, aspirations and fears.

I know Sun's questions because I am about to be on a panel in front of 350 Sun vice presidents and directors. The other panelists are from Gartner Group and International Data Corp. I'm the token journalist. They called me "Dave" in the documents they sent over. If they had called me "Davey," I would have can-

So here are the most interesting of the questions (statements, actually) I'm supposed to ponder, along with the pithiest version of my answer:

1) Java will loosen Microsoft's application programming interface (API) dominance in the marketplace, giving Sun a significant opportunity with desktops and servers.

In response, I'd state this another way:

"Java will give Microsoft another API to dominate in the marketplace. Sun will never be a significant desktop player and will lose servers if any piece of Java code can really run on any server. Or at least. Sun will become more of a commodity player as it loses the

customer lock-in that Unix provides."

2) Network computers will become widely accepted in both corporations and the channel by the year 2000.

It isn't clear what "channel" refers to here, but wide acceptance by corporations means network computers will have to be sold by somebody. Network computers will drift toward commodity

as Network Computer, Inc. and Wyse Technology should create some differen-

3) Sun and IBM will become the dominant players in the midrange and high-end server and storage markets.

Perhaps by attrition. After all, Digital isn't likely to come bounding back -

though its revenue is stronger than Sun's, and anything is possible. Who else? Hewlett-Packard could play here and potentially is a stronger player than Sun. Silicon Graphics seems too problem-plagued. But it's as likely to be Compaq and IBM as IBM and Sun.

4) Sun workstations will continue to be a popular choice for power desktop users and the channel for years to come.

In my PC-centric world, no power user has a Sun desktop, although I recognize the company's dominance in niche markets. It takes a very long time for a platform to die, but unless Sun can rise above its operating systems and manage

Java properly, its desktops will lose popularity with power desktop users.

5) For Sun, technology innovation will be the most important weapon against Micro-

"The most important weapon" sure won't be Sun's public-relations and marketing organizations. Java is a lucky happenstance, not the outcome of a strategic plan, and Sun doesn't seem to have the resources to fight off a hungry

Given those issues, technology innovation will have to be Sun's big gun against Microsoft. If Sun has anything, it's a bunch of smart people. They ought to be building things that everyone - not just wall-to-wall Sun shops — needs.

Looking at Sun, it's easy to see the Apple of five or six years ago. That doesn't mean the company will follow in Apple's footsteps. But unless Sun can do more to become a legitimate software company, rather than a hardware house that plays one on TV ... well, as I said, anything's possible.□

Coursey, an analyst and consultant, is editor of "coursey.com," an online newsletter at www.coursey.com. His E-mail address is david@coursey.com.



Letter-writers sure keep a columnist honest Frank Hayes

o you dined at the expense of a tool vendor any of those things automatically. again, eh?" That's how one reader started in on me after I suggested a few weeks ago that programmers — and managers — need to dump their stick-shift mentality about building systems.

I said it was time to quit fine-tuning and futzing with code by hand and turn to tools that generate applications automatically. I also said the cost-effective way to get faster code is to invest in faster hardware, not to depend on developers to tweak programs by hand in ways that make them harder to maintain.

Naturally, my gentle reader ripped me up one side and down the other.

"Fine-tuning too costly? I have yet to find a tool that did not need 'fine-tuning' to make it do what the user needed (never mind doodads)," the reader wrote. He offered some painfully explicit examples of how developers at his shop have spent the last 20 years working around the broken promises of development tools, from IBM's APS through CASE tools to PowerBuilder.

We will stop 'handoptimization' when the tools do what real people need," he wrote. 'Until then, we will shift gears by hand because the auto-shifters left out the clutch."

Ouch. The really painful thing is, he's right. (About everything

except my getting lunch from a tool vendor, anyhow.) And that's a lot more painful for corporate IS shops than for

After all, computer hardware is cheaper than ever. The cost of building software, supporting users and managing systems is higher than ever. And nobody in IS is getting the tools they need to do

Another letter came after I wrote in a different column that we should expect software to pass clean through its testing cycle, just as we expect airplanes not to crash on their test flights.

"Hate to burst your bubble," the letter read, "but I worked for 15 years at Mc-Donnell Aircraft. One of the problems

we constantly fought was the release of buggy software written by engineers who normally were responsible for the design of aircraft. They often told us that we shouldn't expect our software to be 100% since that wasn't the way designed airthey

planes." So much for software engineering's role models.

And then there are the users. I keep preaching that IS needs to get closer to users, cooperate more with users, give users what they want. As if users their managers - all wanted the same

"[A user] in our group upgraded himself to WordPerfect 7.0 and built some of our forms as templates," another reader wrote. "We can't use them, because our manager has decided to hold off on the upgrade. But [the user] says he can't be left behind waiting for the company to get on with the upgrade. Most of our employees have not even touched the capabilities of 6.1. Go figure.

Ah, users. The dim bulbs are irritating, the clever ones infuriating. If only we could get a whole department of just one kind or the other, maybe we could deliver what each user needs without the management nightmare of a custom setup on each user's desktop.

But that seems unlikely.

So do we give up on supporting users, improving software quality and making the best use of tools that we can? Nope. We can't afford not to do those things, even if we're not getting what we need from vendors, users and managers to do the job right. We've got to keep looking for ways to make it happen.

Even if it isn't as simple as some columnists make it out to be. □

Hayes is Computerworld's staff columnist. His Internet address is frank_hayes



The Back Page

inges of th



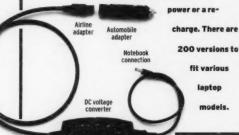
Usenet forums

The following are recent Usenet newsgroup discussion threads found on the Internet. You can pick up the thread by entering keywords at the search engine www. dejanews.com.

- ""Why doesn't the ASCII character set include the cents sign?" (alt.folklore. computers)
- "Network grooming" (comp.dcom. net-management)
- "How many old Univac weenies read this group?" (comp.sys.unisys)
- "Millennium Bomb The Movie" (comp.software. year-2000)

LIFELINE FOR LAPTOPS

Does your laptop battery let you down midflight? Xtend Micro Products in Irvine, Calif., has developed the PowerXtender adapter cable for use with the in-seat power systems being installed by major airlines, including Delta and American. The \$99 adapter also can be plugged in to a car's cigarette lighter for



"Seeking health care information security policies" (comp.admin.policy)

"How do I bridge Ethernet and Token Ring LANs?" (comp.dcom.lans)

MS-WebTV

Watch for the following developments now that Microsoft owns WebTV:

- The TV takes 2 minutes to start up.
- To tape a ball game. you have to learn Visual Basic.
- After a year, Microsoft "enhances" the signal. and your TV is no longer compatible.
- ■Instead of "Seinfeld." vou sometimes get "Error 404: Not Found."

Send your alt cw contributions to mbetts@cw.com. If your item is used. you'll receive a cool T-shirt.

Inside Lines

Exchange glitch bugs mega-users

Several large sites migrating users to Microsoft Exchange are up in arms over the fact that they have to take down the entire server in orarms over the fact that they have to take down the entire server in order to recover the contents of a single mailbox. Exchange 5.0 lacks a
feature called single-user restore, which lets an administrator recover an individual's mailbox without taking the server off-line. The feature has been the subject of many heated messages on Exchangeoriented newsgroups. The Redmond, Wash-based software gianthasn't offered a delivery date for the feature, but several users said
Microsoft told them it wouldn't be in the next release. Notes already supports single-user restore, users said.

MCI and the Holy Grail

Charles Hellings, director of local services at MCI Metro in New York, is taking a multimedia approach toward preparing for the company's pending merger with British Telecommunications. "I've been attempting to brush up on British culture by renting Monty Python movies," Hellings told members of the Communications Managers Association meeting in New York last week.

Go with the flow

We hear Cisco plans to provide NetFlow Switching, its IP network we near cisco plans to provide netriow switching, its in network turbocharging software, for its Catalyst line of LAN switches starting this summer. Netflow Switching will soon be available for the San Jose, Calif., vendor's new three-slot Catalyst 5002 switch, its current five-slot Catalyst 5000 and the new 13-slot Catalyst 5500 switch.

EMC plans data warehousing help

Data center users have grown accustomed to EMC's software efforts, which are built around the Hopkinton, Mass., firm's Symmetrix disk storage systems that support both mainframe and Unix data in one box. Next week in San Francisco, EMC will continue to please when it announces a tool that lets users move mainframe-b data over to Unix database format, industry sources said. Users can then use that DB2 data in Unix-based data warehousing or data mart

Beyond the millennium

Ever wonder what's going to happen to all those year 2000 vendors once we enter the new millennium and their business dries up? Viasoft, Inc. is the first in this group to "articulate a credible answer" to that question, according to a report by Punk, Ziegel & Co., a New York-based investment boutique. Phoenix-based Viasoft plans to create a line of software tools related to the repository of data created in the process of solving the year 2000 problem and reself them to customers to halo were at himself. customers to help manage their applications.

Marines look for a few good games

MAK Technologies, Inc. in Cambridge, Mass., has won a contract to help create what is believed to be the first video game cofunded and codeveloped by the Department of Defense and the entertainment industry. Tentatively titled MEU-31 after a U.S. Marines expeditionary unit, the game is expected to be used to train soldiers in amphibious warfare capabilities. According to MAK, previous video games used by the Marines were "flawed" from a military standpoint, because they contained unrealistic features such as infinite ammunition and characters who could be shot several times before they were injured.

ompaq buying Digital? It's the rumor that just won't die. Talk of a Digital takeover resurfaced last week after Compag posted strong sales and earnings results as Digital revenue continued to slide. One analyst speculated that a combined company, possibly dubbed ComDEC, would have the muscle to take on industry giants such as Hewlett-Packard and IBM. One rumor that Compaq confirmed is that takeover talks have taken place with Gateway 2000. If you have rumors, tips or video games, contact news editor Patricia Keefe at (508) 820-8183 or patricia_ keefe@cw.com.



THERE IS ONE THING THE CLIENTPRO DOESN'T GIVE YOU. HEADACHES.

THE CLIENTPRO™ SERIES

For the ideal line of business PCs - one that makes your life a lot easier - you need stability. You expect reliability. You demand enhanced manageability and lower cost of ownership. On top of that, the machines must be simple

to set up, easy to upgrade and come in neat, network-ready packages which include SMART drives, DMI BIOS support and LANDesk® Possible? Absolutely – with Micron™ ClientPro. Whether you choose the MTA, MTE or XIA, ClientPro combines the features you're looking for with the best overall performance and lower total cost of ownership.

ClientPro also gives you good reason to breathe easier because it's made by Micron – a company recognized as the best in the business for service and reliability. You get the assurance of 24-hour technical support. And an industry-leading, 5-year/3-year limited Micron Power® warranty protects your investment. Stability, reliability and low total cost of ownership. You can have it all with ClientPro. Headaches not included. Call us, or visit our Web site today.









CLIENTPRO MTA

Intel 133MHz Pentium[®] processor 16MB EDO RAM 1.2GB SMART EIDE hard drive 15" Micron 15FGx, .28dp (13.7" display)

\$1,599

CLIENTPRO MTE

Intel 166MHz Pentium processor with MMX™ technology 16MB EDG RAM 1.2GB SMART EIDE hard drive 15" Micron 15F6x, .28dp (13.7" display)

STANDARD FEATURES

512/89 pipeline burst cache, flash BIOS,
DMI support
3/com® 3/C509 network adapter
3.5" floopy drive
Intel LAMDesk Client Merager 3/Unit Journal of Street Control of Street Contr

CLIENTPRO Xvi

Intel 200MHz Pentium Pro processor 32MB EDO RAM 2.1GB EIDE hard drive 15" Micron 15FGx, .28dp (13.7" display) \$2,269

STANDARD FEATURES

256KB internal L2 cache, flash BIOS, DMI support 12X EIDE CD-ROM drive 3Com 3C509 network adapter 3.5" floppy drive PCI 64-bit graphics accelerator, 2MB EDO RAM

Tool-free minitower or desktop Microsoft Mouse, 104-key keyboard Microsoft Windows NT® Werkstation Intel LANDesk Client Manager 5-year/3-year limited Micron Power

CALL NOW FOR DETAILED PRICING AND OPTIONS







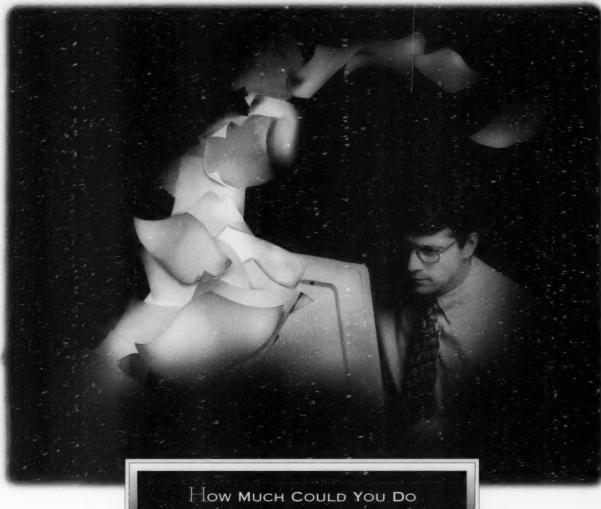
MICRON POWER

Micron Sales Hours: Mon-Fri Gern-Topm, Sat 7am-Spm (MT) - Technical Support Avr. 24 Hours A Day-7 Days A Week - Toillitee from Mexico: 95-800-706-7755 Toillitee from Canada: 800-708-1755 - Toillitee from Peterlo Ricc: 800-708-1756 International Sales: 208-983-8970 - International Fax: 208-893-7393



800 • 776 • 4505

www.micronpc.com



WITH A LITTLE MORE MEMORY?

A NEW STUDY SAYS UP TO 63% MORE.



Recent test results, conducted by an independent research firm using the Ziff Davis Winstone 32 Benchmark, confirm the link

the study revealed that by adding more memory, you can improve your PC's performance by up to 63%. It also found that more memory gives you the power needed to run the newest operat-

between productivity and memory.* Remarkably,

ing systems, such as Windows NT® and Windows® 95. Plus, you can run multiple applications simultaneously without long delays. So why Kingston® memory? In 2 word, reliability. We test every cell on every chip on every module. On a 16 megabyte module, that's 128 million cells. At Kingston, our

memory is customized to the requirements of the system or class of systems in which it will be used. So you will always get the right memory (guaranteed 100% compatible) the first time

you order. On top of that, we can ship most orders within 24 hours. To receive a brochure about the study or to find out more about Kingston, just give us a call at (800) 533-8714.



For more information call us at (800) 533-8714 () or look for us on the Net:http://www.kingston.com/cw.htm

Calif., (Janon Cheng, (408) 321-3400) to conduct an independent benchmark study of the effects of memory in PCs running either Windows 95 or Windows NT 4.0. The Ziff-Davin Winstone 32 Renchmark standard was selected to test 600 Newhope Street, Fountain Valley, CA 92708 USA, (714) 455-2600, Fax (714) 455-2699. © 1996 Kingston Technology Company. All rights reserved. Kingston is a registered trademark and Computing Without Limits is a trademark

